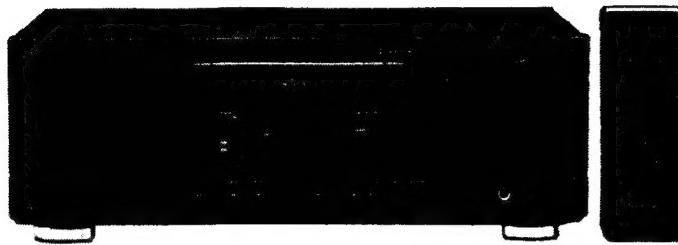
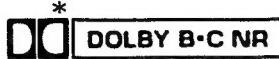


Service Manual

Digital Compact Cassette Deck

RS-DC10

Colour		
Area	(K) ... Black Type	
(EB)	Great Britain. Germany, Italy and Europe. Asia, Latin America, Middle Near East and Africa.	(K)
(EG)		
(G)		

NEW MECHANISM FOR RS-DC10 (AR350D)**SPECIFICATIONS****Digital Recording/Playback**

Tape recording system: Stationary head type DCC

Sampling frequencies

(Analog input recording): 44.1 kHz

(Playback/digital input recording):

48 kHz, 44.1 kHz, 32 kHz

(selected automatically)

No. of quantizing bits: 16-bit linear

Audio coding system: PASC

No. of channels: 2-channel (stereo)

Frequency response: 10 Hz - 20,000 Hz (± 0.2 dB)

(48 kHz sampling frequency):

10 Hz - 22,000 Hz (± 0.2 dB)

(32 kHz sampling frequency):

10 Hz - 14,500 Hz (± 0.2 dB)

THD

(Playback):

0.003% or less (1 kHz, 0 dB)

(Recording/playback):

0.005% or less (1 kHz, 0 dB)

Dynamic range

(Playback):

95 dB or more (A-weighted)

(Recording/playback):

92 dB or more (A-weighted)

S/N ratio

(Playback):

98 dB or more (A-weighted)

(Recording/playback):

92 dB or more (A-weighted)

Channel separation

(Playback):

95 dB or more (1 kHz)

(Recording/playback):

80 dB or more (1 kHz)

Wow and flutter:

Below measurable limit

Analog Cassette Tape Playback

Deck system:

Analog compact cassette

Track system:

4-track, 2-channel (stereo)

Frequency response (Dolby NR off)

Normal:

30 Hz - 15,000 Hz ± 3 dBCrO₂:30 Hz - 16,000 Hz ± 3 dB

Metal:

30 Hz - 17,000 Hz ± 3 dBS/N (signal level = 250 nwb/m, CrO₂ type tape)

NR off:

56 dB (A-weighted)

Dolby B NR on:

65 dB (CCIR)

Dolby C NR on:

74 dB (CCIR)

Wow and flutter:

0.07% (WRMS)

 ± 0.2 % (DIN)**Terminals**

Analog input

Input sensitivity:

60 mV (-12 dB)

Input impedance:

47 k Ω

Analog output (Fixed)

Output level:

500 mV (DCC: -12 dB)

Maximum output level:

2 V (DCC: 0 dB)

Output impedance:

440 Ω

Variable analog

Output:

Using remote control

Headphones output

Maximum level:

30 mW + 30 mW (3.2 Ω load)

Load impedance range:

8 - 600 Ω

Digital input:

Coaxial 75 Ω /optical

(with select SV)

Coaxial 75 Ω /optical

(parallel output)

Technics

■ Mechanism

Heads:	20-channel thin film head
Tape drive system:	Single capstan drive (Auto reverse)
Tape drive motors	
Capstan:	DC servo motor
Reel table:	DC motor
Tape speed:	4.76cm/sec. (1-7/8 ips.)
Fast forward and rewind times:	Approx. 100sec. with D-60 cassette tape

■ General

Power consumption:	35W
Power supply:	
For (EG) area:	AC 50/60Hz, 230V
For (EB) area:	AC 50/60Hz, 240V
For (G) area:	AC 50/60Hz, 110V, 120V, 240V, 220V
Dimensions (W × H × D):	430 × 153 × 341 mm
Weight:	8.3kg

Note:

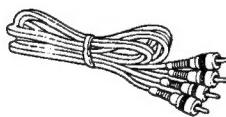
Specifications are subject to change without notice.
Weight and dimensions are approximate.

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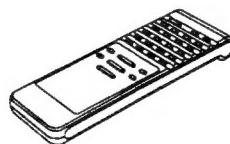
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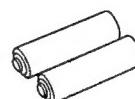
Note: • Refer to the measurement and adjustment of supplement manual (Order No. AD9212389C8).

■ ACCESSORIES

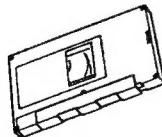
• Stereo connection cable
(SFDHM03N02)..... 2 pcs.



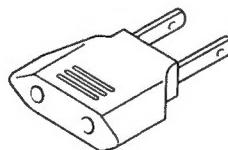
• Remote control transmitter
(ZK011D0020)..... 1 pc.



• Batteries..... 2 pcs.
for remote control transmitter
*(UM-4, "AAA" (R03))



• DCC tape 1 pc.
for recording purposes
*(RT-D60E)



• Power plug adaptor
(YJ04001280)
for (G) area only

* These are available on sale route.

■ MAIN FEATURES OF DCC

1. Compatibility with Conventional Analog Format

■ Backward Compatibility

Since every DCC machine can also play analog compact cassettes, DCC is sure to be acceptable to most users. This backward compatibility is particularly attractive in car audio and headphone stereo applications. It saves space since only one machine is needed to play cassettes in either format. There's no need to carry or install separate players for analog and digital.

To provide this compatibility, all DCC machines have bi-directional auto reverse operation, using a unique half digital, half analog head configuration.

■ Mechanical Simplicity

DCC machines use a stationary head configuration, rather than the helical scan rotating head system required for DAT (and VCRs). Except for the head itself, analog tape transports can, for the most part, be used for DCC.

2. Latest in Digital Technology

■ PASC — Newly Developed Intelligent Coding System

Without PASC, the DCC format could not use a linear-tracking stationary head and ordinary coercivity tape, and therefore would not achieve playback compatibility with analog cassettes. PASC effectively reduces the amount of information that needs to be stored, thereby lessening the storage density requirements of the media and the bit-rate requirements during write/read (recording/playback) operations. You could say that PASC lightens the work load of the transducers (heads) and media (tape) by taking an "intelligent" approach to the coding process.

To understand this difference, let's take a look at linear PCM coding first. Despite the incredible precision and sophistication of linear PCM, it is not designed, nor in fact is it necessary, to consider which data is essential and which is irrelevant. Linear PCM is designed to simply encode all the data presented to it. The result of linear PCM is an output waveform that is physically identical to the input waveform (after anti-aliasing low-pass filtering). All of the measurable information contained in the original input waveform is retained in the reproduced output waveform.

PASC, in contrast, analyzes the input waveform to determine which portions are really needed. Such an approach may appear heretical to audio purists, but it is in fact the basis of many already widely accepted technologies.

DCC Player/Recorder Block Diagram

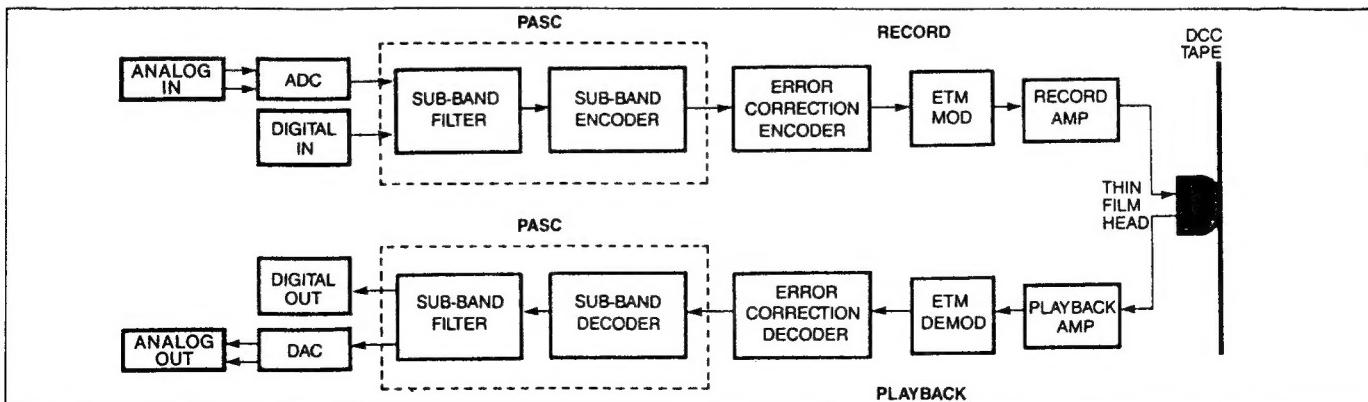


Fig. 2

■ Plentiful Musicassettes

DCC has enlisted the support of the world's major record companies. Working with the Philips team, some of them even participated in DCC development.

Whereas there were only a small number of disc titles when the CD first came out, an extremely wide variety and large number of prerecorded titles will be available on DCC from the very first day the format is launched.

In addition, existing 32-times and 64-times high speed tape duplication equipment requires only slight modification to handle dubbing of DCC tapes, so manufacturing costs of prerecorded DCC cassettes promise not to be significantly higher than those of analog prerecorded cassettes.

PASC — High Efficiency Intelligent Coding

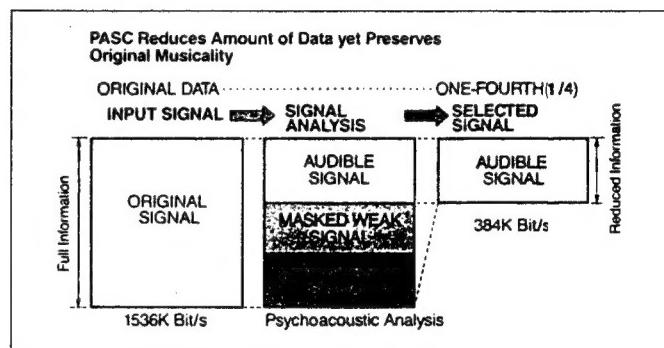


Fig. 1

As shown here PASC simply applies proven psychoacoustic principles, such as the masking effect and hearing threshold, to economize on data. Therefore, instead of reproducing what the original waveform looks like, PASC reproduces what the original waveform sounds like.

Since this is, to a large extent, a value judgment, audio engineers from a major record company were involved in the fine-tuning of PASC to assure the system offered outstanding "musicality."

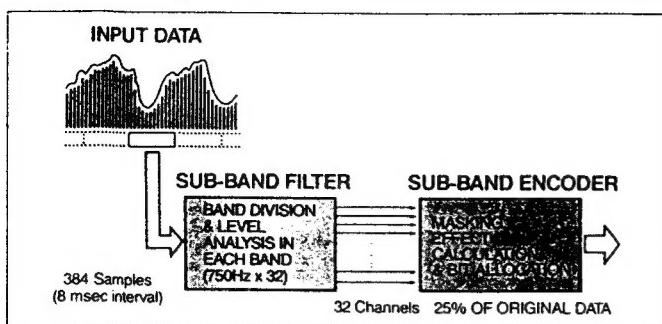
PASC Encoding Process

Fig. 3

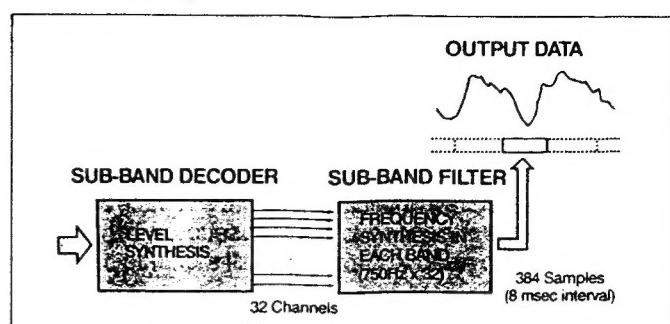
PASC Decoding Process

Fig. 4

■ THIN-FILM HEAD AND TRACK DISTRIBUTION**1. Eight Digital Tracks plus One Auxiliary Track**

DCC tape is divided into an upper sector (forward) and lower sector (reverse), physically corresponding to side B (reverse) and side A (forward) of an analog tape. Each sector comprises eight tracks for digital audio data and one track for auxiliary data.

Recording lays down tracks 185 microns wide, whereas playback looks at only a 70 micron portion of this width. This means that transport accuracy becomes less critical, the possibility of mistracking is virtually eliminated, and manufacturers can largely use existing analog cassette transport components.

2. Stationary Thin-Film Head

Along with PASC, this was another key to the development of DCC equipment. To handle its narrow track pitch of 195 microns, DCC uses a precision head fabricated by thin-film technology (related to the lithographic process employed in LSI manufacturing).

For recording, new digital data is simply overwritten so no separate erase facility is provided. For bi-directional operation, head configurations will be: a) turnover type digital 9-track head (upper) and analog 2-track head (lower), or b) fixed-type twin head.

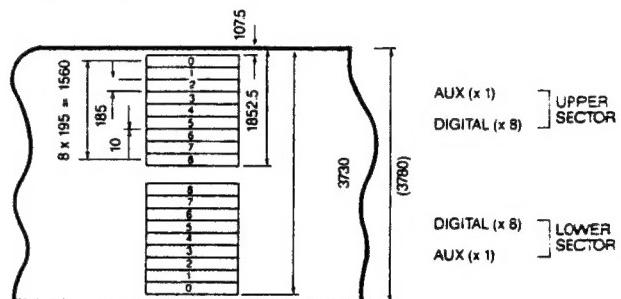
Digital Track Distribution

Fig. 5

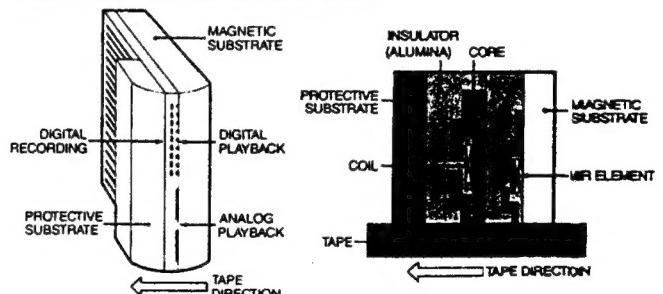
DCC Thin-Film Head Structure

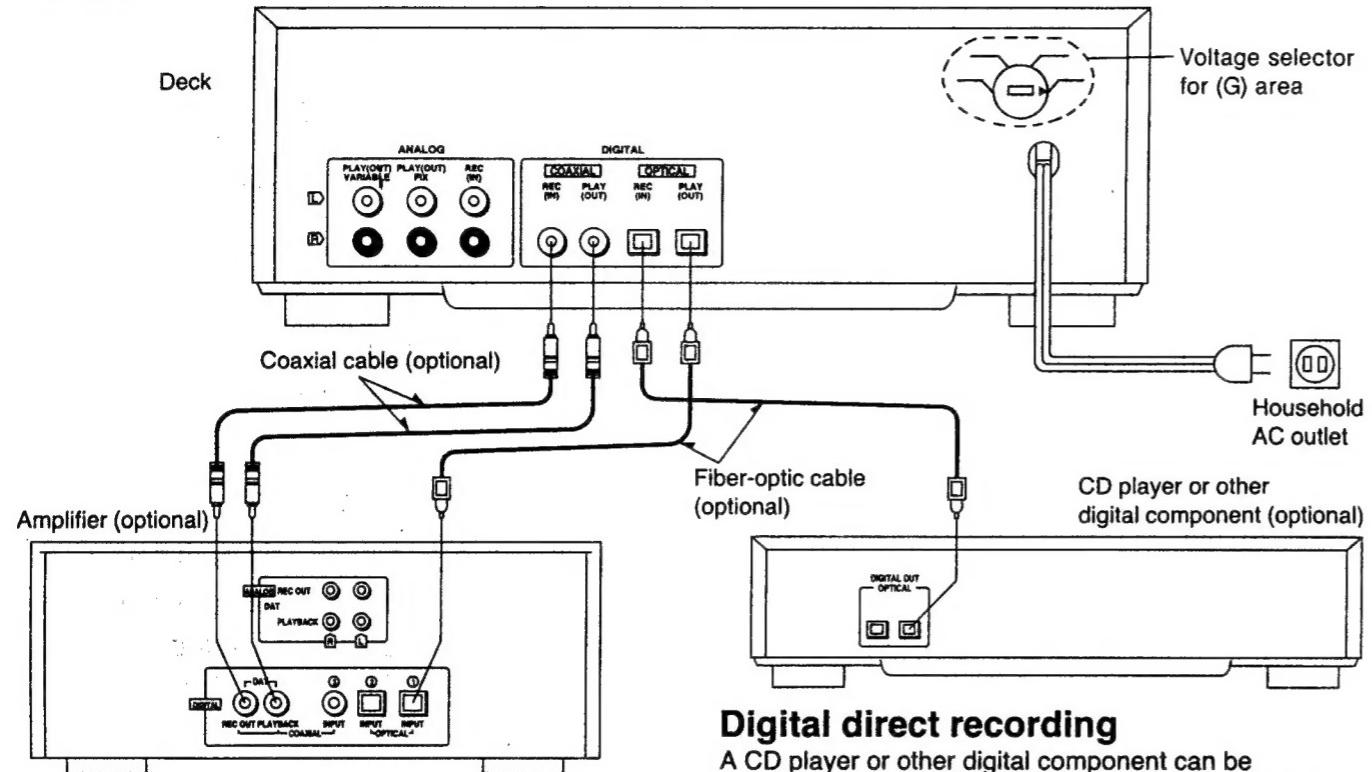
Fig. 6

■ CONNECTIONS

Be sure to turn off the power to all the components before proceeding to connect them. Connect the power cable only after all the other connections have been performed.

Digital connections

There are two ways to perform the digital connections: either connect a digital amplifier to the deck or connect another digital component directly to the deck.



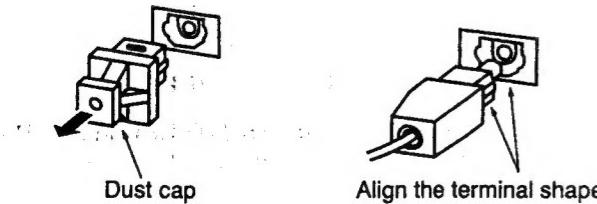
Digital direct recording

A CD player or other digital component can be connected directly to the deck and the digital signals of that component can be recorded without further ado. (See "SCMS" on pages 11 and 12.)

About Optical Fiber Cables

To connect optical fiber cables

- ① Remove the dust cap
- ② Connect the cable from the terminal.



Do not attempt to bend optical fiber cables at severe angles.

Be sure that connections are made securely.

About OPTICAL connector

When the optical connectors are used, electrical signals are converted into light signals for transmission between units, making the signals impervious to adverse effects from external noise. This form of connection thus allows the highest quality of digital audio signal transmission.

■ CAUTION FOR AC MAINS LEAD

FOR (EB) area only

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience. A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced. If you lose the fuse cover the plug must not be used until a replacement cover is obtained. A replacement fuse cover can be purchased from your local dealer.

CAUTION!

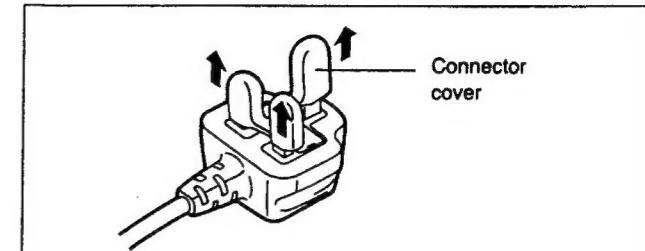
IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY. THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug marked with the letter E or the Earth Symbol .

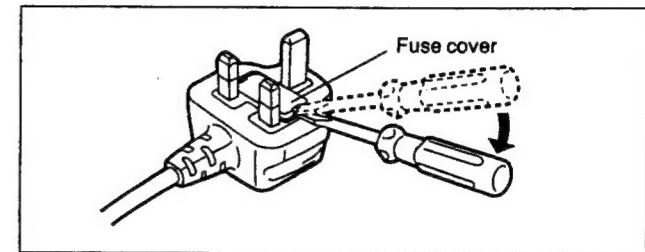
Before use

Remove the connector cover as follows.

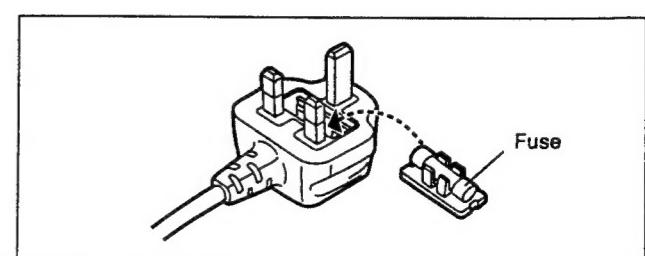


How to replace the fuse

1. Remove the fuse cover with a screwdriver.



2. Replace the fuse and attach the fuse cover.



If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral
Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

FOR (G) area only

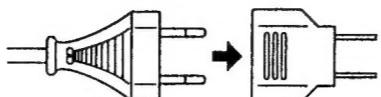
Be sure to disconnect the mains cord before adjusting the voltage selector.

Use a minus (-) screwdriver to set the voltage selector (on the rear panel) to the voltage setting for the area in which the unit will be used.

(If the power supply in your area is 117 V or 120 V, set to the "127 V" position.)

Note that this unit will be seriously damaged if this setting is not made correctly. (There is no voltage selector for some countries; the correct voltage is already set.)

If the power plug will not fit your Household AC outlet, use the power plug adaptor (included).

**SUGGESTIONS FOR SAFETY****■ Use a standard AC wall outlet**

1. Use from an AC power source of high voltage, such as that used for an air conditioner, is very dangerous.

A fire might be caused by such a connection.

2. A DC power source cannot be used.

Be sure to check the power source carefully, especially on a ship or other place where DC is used.

■ Grasp the plug when disconnecting the power supply cord**1. Wet hands are dangerous.**

A dangerous electric shock may result if the plug is touched by wet hands.

2. Never place heavy items on top of the power supply cord, nor force it to bend sharply.**■ Place the unit where it will be well ventilated**

Place this unit at least 10 cm (4") away from wall surfaces, etc.

Be careful that curtains and similar materials do not obstruct the ventilation holes.

■ Avoid places such as the following:

In direct sunlight or in other places where the temperature is high.

In places where there is excessive vibration or humidity.

Such conditions might damage the cabinet and/or other component parts and thereby shorten the unit's service life.

■ Be sure to place the unit on a flat, level surface.

If the surface is inclined, a malfunction may result.

■ Never attempt to repair nor reconstruct this unit

A serious electric shock might occur if this unit is repaired, disassembled or reconstructed by unauthorized persons, or if the internal parts are accidentally touched.

■ Take particular care if children are present

Never permit children to put anything, especially metal, inside this unit. A serious electric shock or malfunction could occur if articles such as coins, needles, screwdrivers, etc. are inserted through the ventilation holes, etc. of this unit.

■ If water is spilled on the unit

Be extremely careful if water is spilled on the unit, because a fire or serious electric shock might occur. Immediately disconnect the power cord plug, and consult with your dealer.

■ Avoid spray-type insecticides

Insecticides might cause cracks or "cloudiness" in the cabinet and plastic parts of this unit. The gas used in such sprays might, moreover, be ignited suddenly.

■ Never use alcohol or paint thinner

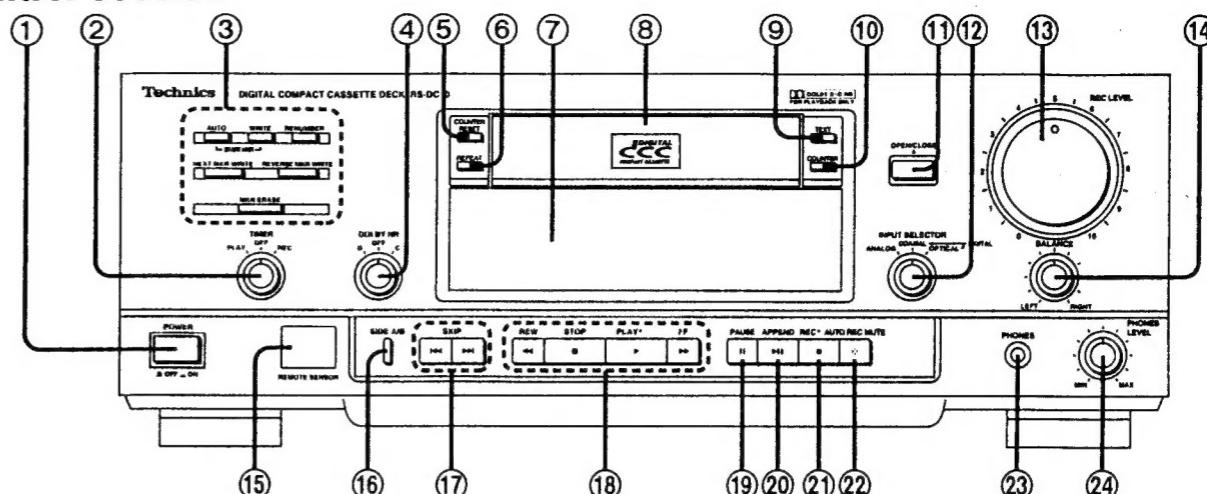
These and similar chemicals should never be used, because they might cause flaking or cloudiness of the cabinet finish.

■ Disconnect the power supply cord if the unit will not be used for a long time

If the unit is left for a long time with the power ON, this not only will shorten its useful operation life, but also may cause other trouble.

■ If trouble occurs

If, during operation, the sound is interrupted or indicators no longer illuminate, or if an abnormal odour or smoke is detected, immediately disconnect the power cord plug, and contact with your dealer or an Authorized Service Center.

■ LOCATION OF CONTROLS**Control section****① Power switch (POWER)****② Timer switch (TIMER)**

Use this when a timer from an audio store has been connected to start playback or recording at a particular time.

③ Marker control section**AUTO START MKR:**

For setting the start marker's writing mode to automatic or manual.

START MKR WRITE:

For writing the start marker manually.

RENUMBER:

For renumbering the track sequence when correcting the track numbers.

NEXT MKR WRITE:

For writing the next marker which automatically activates playback from the start of the reverse side.

REVERSE MKR WRITE:

For writing the reverse marker which automatically reverses the tape side from A to B.

MKR ERASE:

For erasing written markers.

④ Dolby NR selector (DOLBY NR)

This can be set to Dolby B, C or OFF, depending on which Dolby position, if any, was used for the recording on the analog cassette tape which is to be played back.

⑤ Counter reset button (COUNTER RESET)

Use this to return the tape counter to "0000".

⑥ Repeat mode selector button (REPEAT)

Use this to switch to the repeat play mode.

⑦ Display section

(See page 7 for details.)

⑧ Cassette tray**⑨ Text Information selector button (TEXT)**

Use this to select what is to be displayed—the title of the track now being played, etc.

⑩ Counter selector button (COUNTER)

Use this to select the tape counter's display mode.

⑪ Cassette tray open/close button (OPEN/CLOSE)

Use this to open or close the cassette tray.

⑫ Input selector (INPUT SELECTOR)

Use this to select the analog (ANALOG)/digital input (COAXIAL/OPTICAL).

⑬ Recording level control (REC LEVEL)

Use this to adjust the recording level when analog input signals are being recorded.

⑭ Balance control (BALANCE)

Use this to adjust the balance between the left and right channels when analog input signals are being recorded.

⑮ Remote control sensor (REMOTE SENSOR)

Use this to select the direction in which the tape is to travel.

⑯ Tape travel selector button (SIDE A/B)

Use this to skip to the track you want to hear.

⑰ Skip buttons (SKIP ▲◀◀ / ▶▶)

Rewind button (REW ▲◀◀)

Stop button (STOP ▶)

Play button and indicator (PLAY ▶)

Fast forward button (FF ▶▶)

⑲ Pause button (PAUSE II)**⑳ Append recording button (APPEND ▶II)**

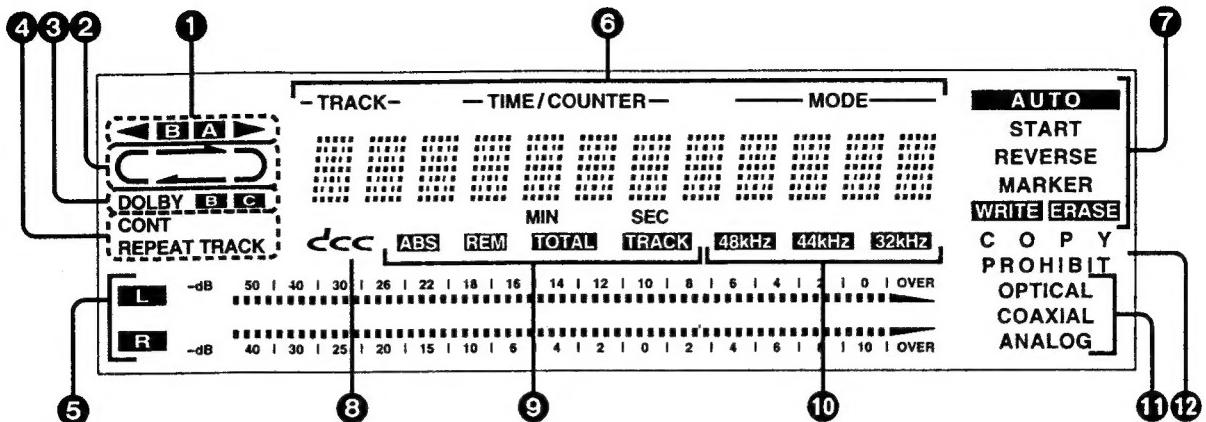
Use this to search for the end of the recorded section on the tape where more material is to be appended, and set the deck to the recording standby mode.

㉑ Record button and indicator (REC ●)**㉒ Recording mute button (AUTO REC MUTE ○)**

Use this to create unrecorded blanks between tracks on the tape.

㉓ Headphones jack (PHONES)**㉔ Headphone volume control (PHONES LEVEL)**

Display section



1 Tape travel direction indicators (◀ B / A ▶)

These indicate the direction in which the tape is traveling.

(The **B / A** display appears only when a DCC tape is used.)

2 Reverse mode indicator

This indicates the reverse mode.
(For analog cassette tapes only)

3 Dolby NR indicators (DOLBY B C)

These indicate the type of Dolby noise reduction which has been selected. When both of these indicators are off, it means that neither type of Dolby noise reduction has been selected.

4 Repeat mode indicators (CONT REPEAT/REPEAT TRACK)

CONT REPEAT:

All tracks are repeated.

REPEAT TRACK:

The track being played is repeated.
(For DCC tapes only)

5 Level meters

These indicate the input levels during recording and the levels recorded on the tape during playback.

When a DCC tape is used, the values at the top are displayed; when an analog cassette is used, the values at the bottom are displayed.

6 Text information/counter display section

When a prerecorded DCC music tape is played back, text information relating to what is being played appears on the display.

Track number display (TRACK):

This indicates the number of the track which is being played back or recorded.

Timer/counter display (TIME/COUNTER):

This indicates how many minutes and seconds of the track which is being played back or recorded have elapsed or it shows the tape counter display.

Mode display (MODE):

This indicates the operating mode which is currently established.

7 Marker indicator section

Start marker automatic indicator (AUTO):
This lights when the start marker is set to the automatic writing mode.

Start marker indicator (START):

This lights when the start marker has been written manually or when the start marker position is reached.

Reverse marker indicator (REVERSE):

This lights when the reverse marker has been written or when the reverse marker position is reached.

Marker indicator (MARKER):

This lights when any of the marker positions is reached.

Marker write indicator (WRITE):

This lights while a marker is being written.

Marker erase indicator (ERASE):

This lights while a marker is being erased.

8 DCC indicator (dcc)

This lights only when a DCC tape is being used.

9 Counter display indicators (ABS, REM, TOTAL, TRACK)

The indicator corresponding to the setting of the COUNTER selector button is selected as follows.

ABS : Absolute time display

REM : Time remaining on one side of the tape

REM TOTAL : Total time remaining on the tape

TRACK : Elapsed time of track now being played.

10 Sampling frequency indicators (48kHz, 44kHz, 32kHz)

These indicate the sampling frequency during the playback or recording of digital signals.
(For DCC tapes only)

11 Input indicator section

The indicators listed below light up when the INPUT selector has been set to the corresponding positions.

Optical input indicator (OPTICAL)

Coaxial input indicator (COAXIAL)

Analog input indicator (ANALOG)

12 Digital copy prohibit indicator (COPY PROHIBIT)

This lights when a copy prohibit signal is included among the source signals when digital input signals are supplied.

■ ABOUT DCC TAPE

Types of tapes which can be used

The types of tapes described below can be used with this deck.

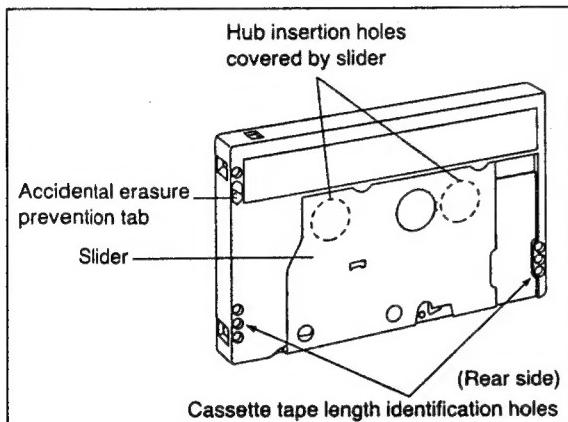
Digital compact cassette tapes (DCC)

There are two types of DCC tapes.

1. Prerecorded DCC music tapes available in stores:
For playback only
2. DCC tapes for recording

Conventional analog cassette tapes: For playback only (Analog compact cassette tapes)

DCC tapes for recording



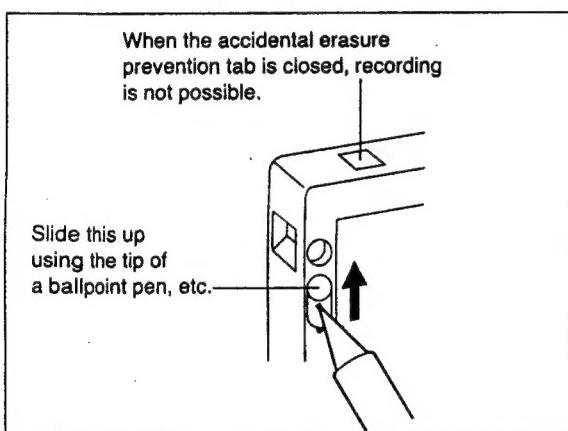
Unlike analog cassette tapes, DCC tapes are completely sealed, and their tape and hub holes are protected by a slider.

This design ensures that, except when the cassette is loaded, dust and foreign particles will not enter the cassette housing and cause dropouts (digital signal losses) which are the main cause of deterioration in the quality of digital recordings.

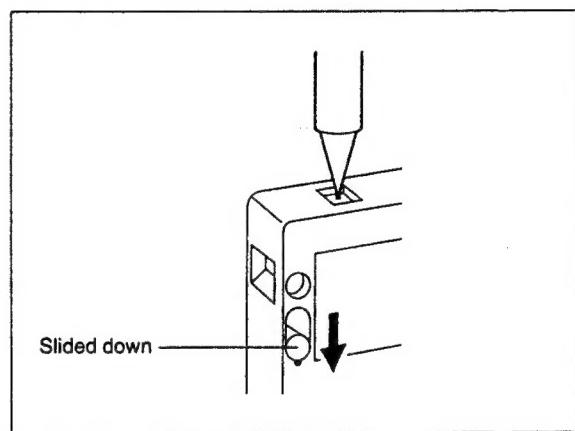
DCC tapes for recording come in lengths of 45, 60 and 90 minutes.

Tampering with the cassette tape length identification holes in any way can cause malfunctioning.

Safeguarding against the accidental erasure of a valuable recording



Recorded tapes that you want to keep can be protected by sliding the accidental erasure prevention tab on the rear side of the cassette to the "up" position shown in the diagram. It will then be impossible to record on the tape, thus protecting important recordings from accidental erasure.



To re-record

Return the accidental erasure prevention tab to its indented (open) position.

Handling precautions

Do not open the cassette's slider to pull the tape out or touch it.

Take care not to drop the cassette, hit it or subject it to strong vibration.

The cassette cannot be turned over and used.

Storage precautions

Replace the cassette in its case and store away.

Do not place or store tapes in the following places:

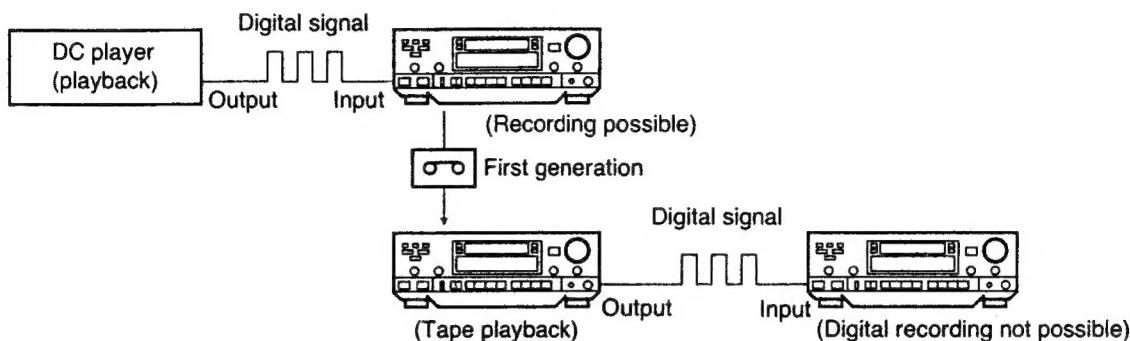
1. Where it is very hot (over 35°C) or very humid (over 80%)
2. Where there are strong magnetic fields (near speakers or on top of a TV set, etc.)
3. Where the tapes will be exposed to direct sunlight

■ SCMS (SERIAL-COPY-MANAGEMENT-SYSTEM)

This unit is equipped with SCMS (Serial Copy Management System). SCMS is a system which allows digital-signal copying of CDs and commercial music DCC tapes only for one "generation". The DCC tape thus recorded cannot be used as a master tape

to produce further generations (serial copies) of the first digital copy. The accompanying illustrations describe the ways in which recording is possible from each kind of source.

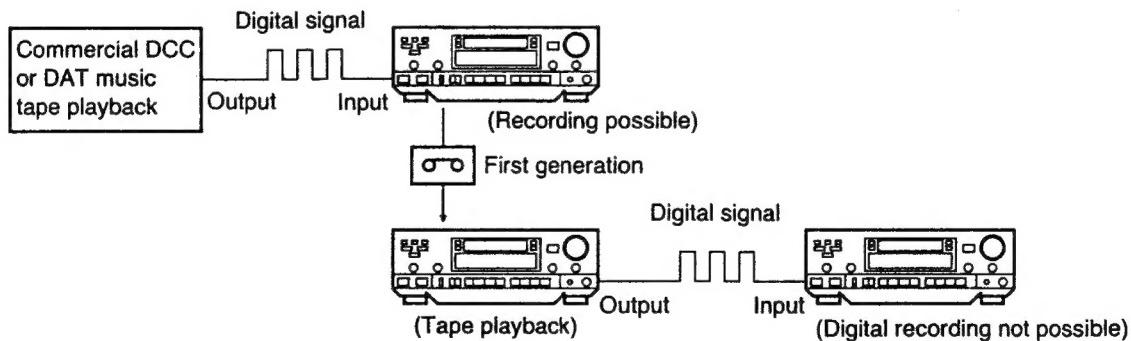
1 DCC tapes recorded digitally from CDs



Digital-signal recording from a CD can be performed only for the first generation of DCC tape. The DCC tape thus recorded (1st generation) cannot be used as a master to make further digital copies (serial copies).

Digital signals from a CD player recorded on a DAT cannot be recorded in their original form from the DAT tape onto a digital compact cassette tape in their original form. Similarly, digital signals from a CD player recorded onto a DCC in their original form cannot be recorded from the DCC tape onto a digital audio tape in their original form. In other words, SCMS restricts the recording of digital signals even when different digital recording equipment such as DAT and DCC are used in combination.

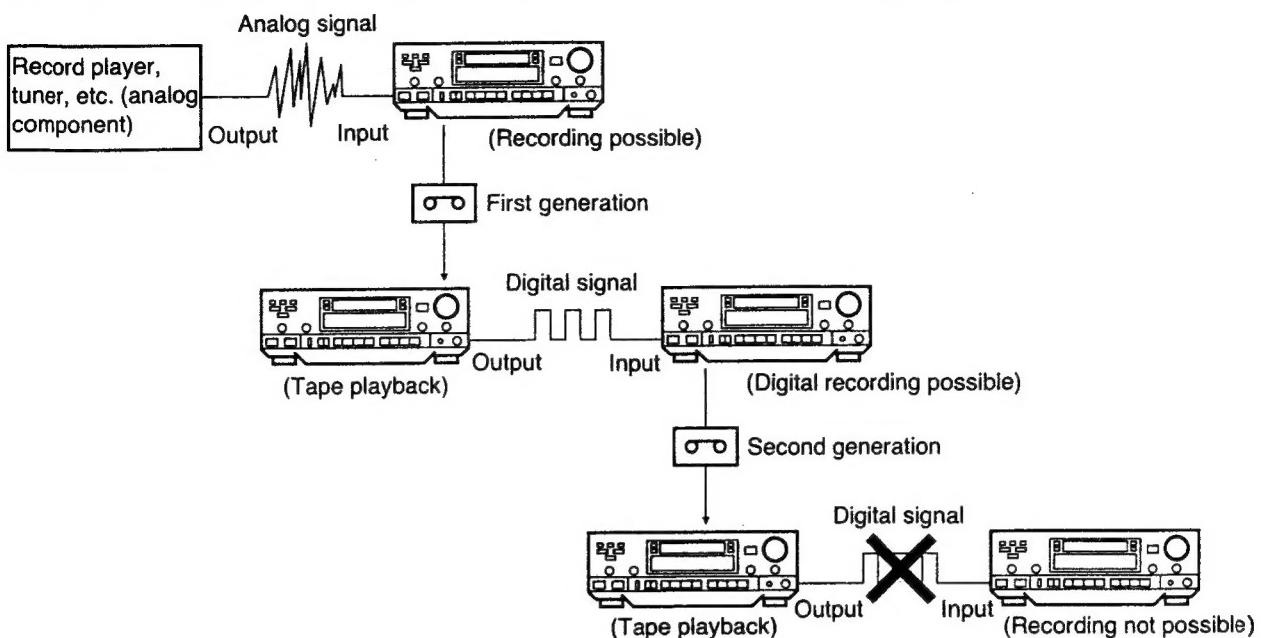
2 DCC tapes recorded digitally from a commercially produced music DCC tape or DAT cassette



Digital-signal recording from a commercially produced DCC or DAT music tape can be performed only for the first generation of DCC tape. The DCC tape thus recorded (1st generation) cannot be used as a master to make further digital copies (serial copies).

However, it should be noted that it may not be possible to make digital copies from commercial DCC or DAT music tapes which do not conform to the SCMS format.

3 DCC tape recorded from analog input terminals (when thereafter recorded digitally)



When the DCC recording of an analog source is used as the master tape for further digital-signal DCC copies, up to two generations of digital copies can be made. However, the second generation of such

copies cannot be used as the master tape for making third and subsequent generations of digital copies (serial copies).

4 DCC tapes recorded from analog input terminals (when recorded in analog thereafter)

When recording is performed from the analog input terminals, no restrictions are made on copies, in the same way as for conventional audio cassette tape recorders. Accordingly, even in cases where

recording of the digital signal (digital copy) is not possible, the analog input and output terminals can be used to perform analog recording.

Digital copy prohibit display

In the following cases, digital signals cannot be recorded in their original form:

When recording signals from a source which has been digitally copied once before

The COPY PROHIBIT indicator lights.

C O P Y
P R O H I B I T

When a copy prohibit signal is supplied during recording

S C M S S T O P

When a copy prohibit signal is supplied in the recording standby mode

S C M S

■ HANDLING PRECAUTIONS FOR DCC HEAD

Because static electricity or magnetism can damage the DCC head, please observe the following when handling the DCC head.

1) Caution on magnetism

Be sure to use only the designated screwdriver (RFKZ0037) when making aztec adjustment.

Never use a steel screwdriver or other screwdriver whose blade or tip is magnetized.
Keep the DCC head away from all magnetized objects.

2) Caution on static electricity

Be sure to insert a shorting clip in the terminal of the FPC board (DCC head).

Connect the FPC board to the PCB connector as quickly as possible.

3) Others

Be especially careful not to use force when manipulating the FPC board or it will break or disconnect.

• Grounding for electrostatic breakdown prevention

1. Human body grounding

Use the anti-static wrist strap to discharge the static electricity from your body.

2. Work table grounding

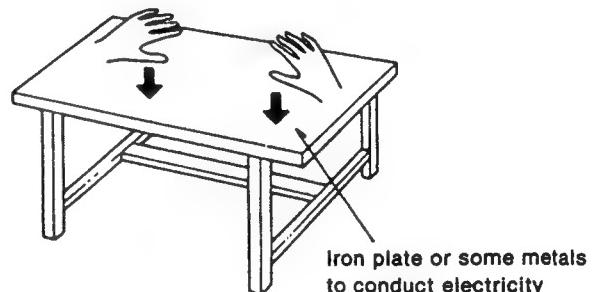
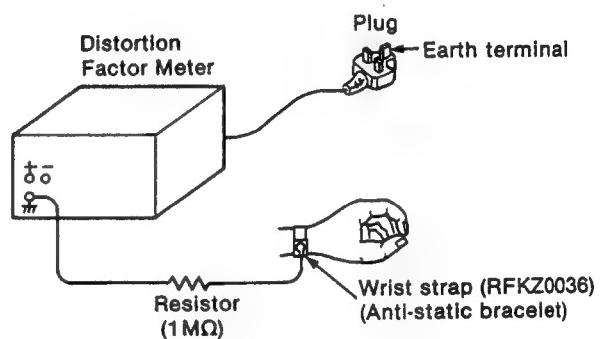
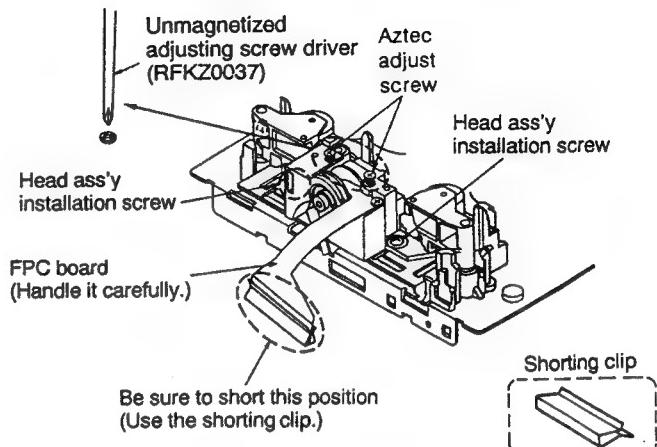
Put a conductive material (sheet) or steel sheet on the area where the DCC head is placed, and ground the sheet.

Note:

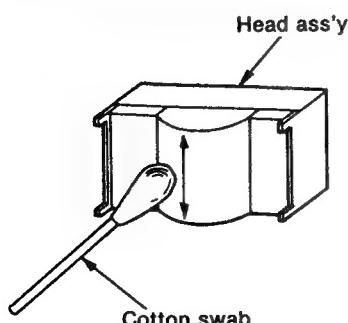
It is important to ground the instrument before testing. Use either the ground contact of a nearby 3P wall outlet, or connect it to the frame ground of an instrument which is connected a 3P wall outlet.

Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the DCC head.



■ HEAD CLEANING METHOD

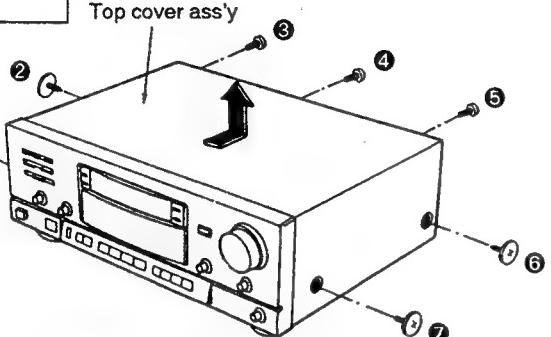
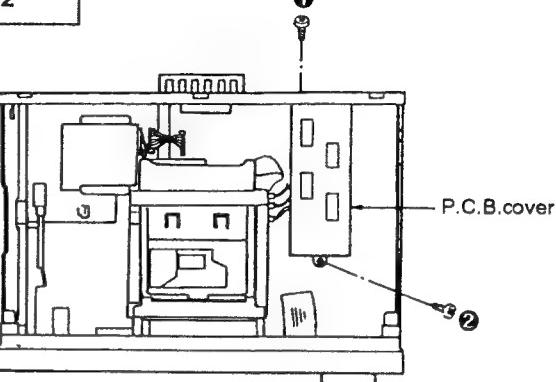
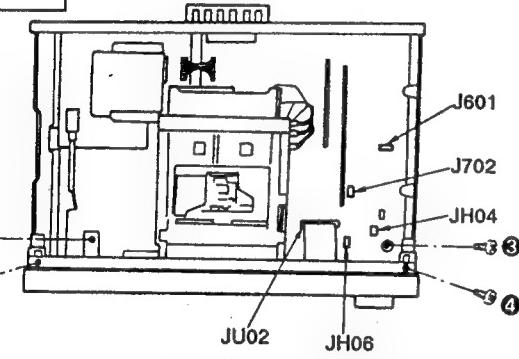
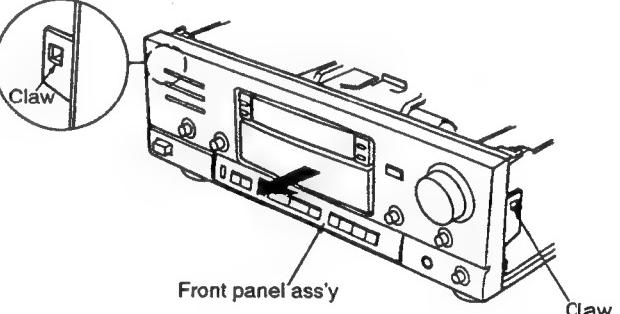
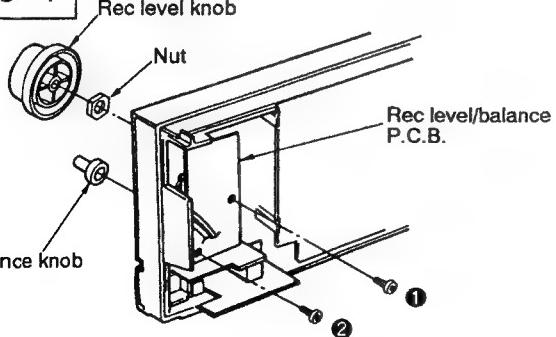
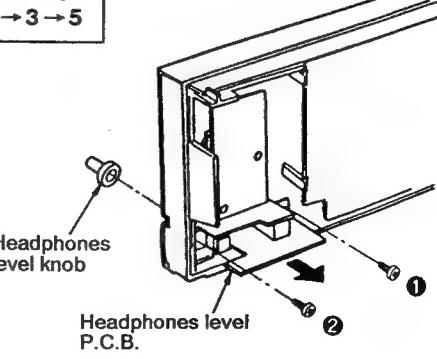


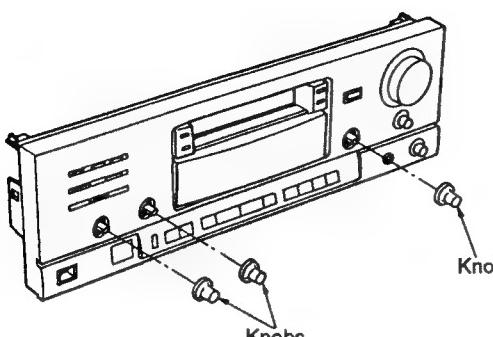
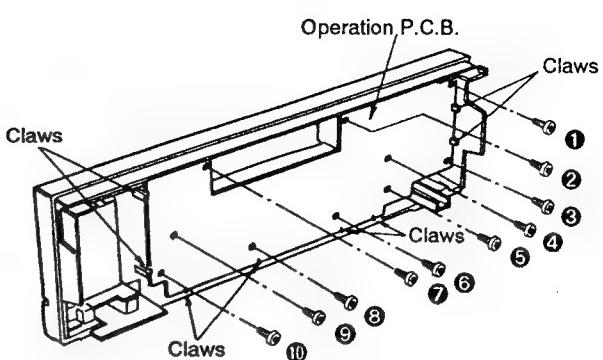
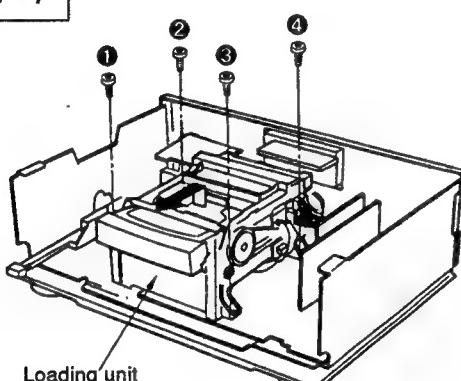
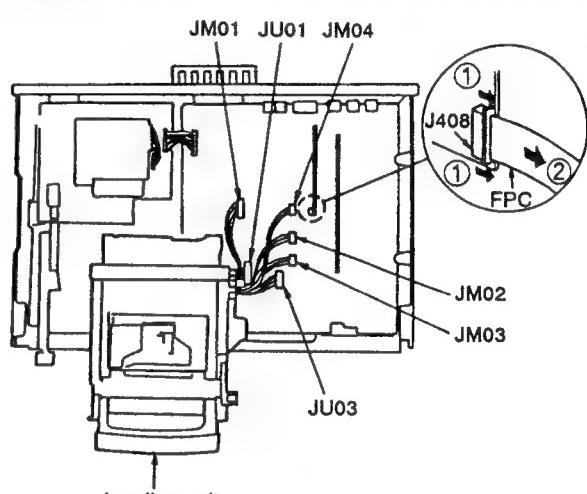
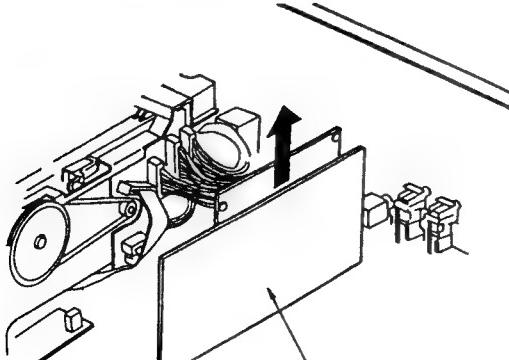
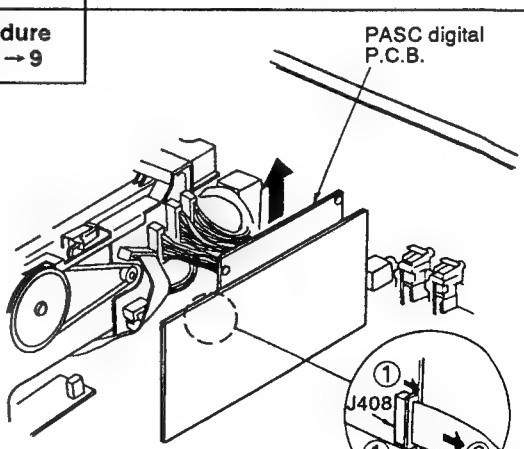
Clean the head up and down with a cotton swab slightly moistened with alcohol.

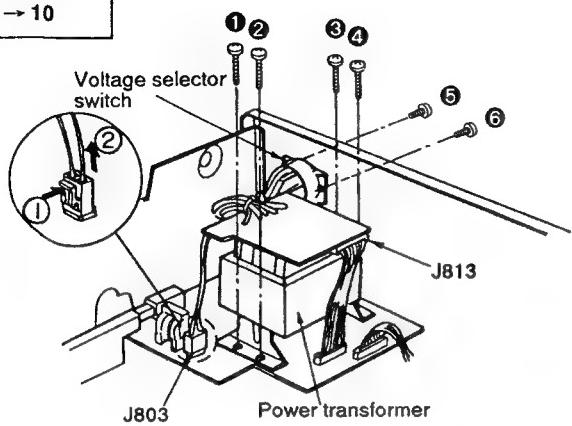
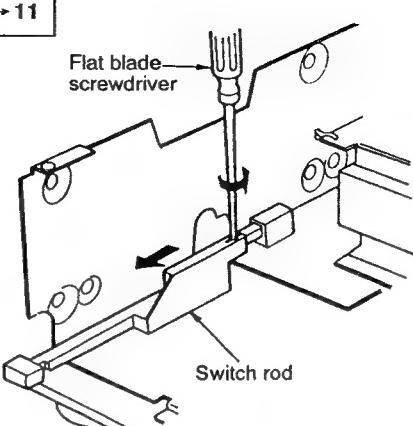
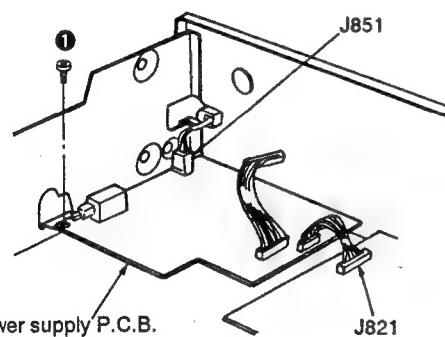
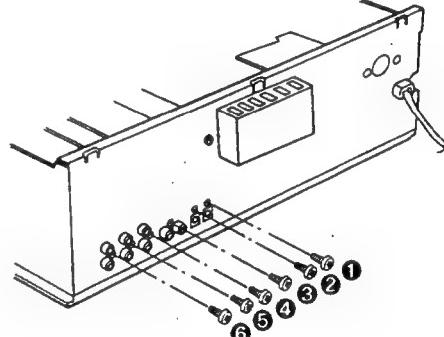
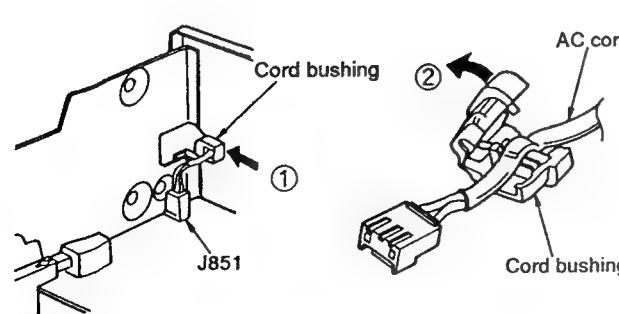
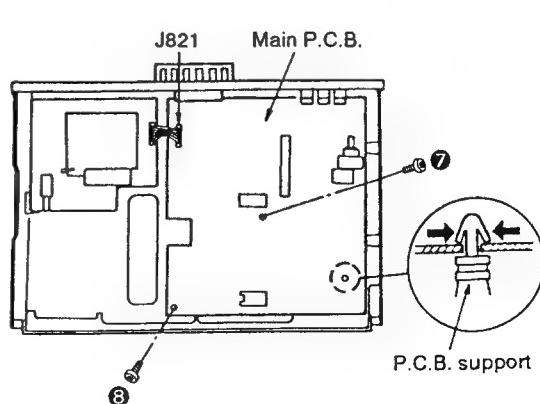
■ DISASSEMBLY INSTRUCTIONS

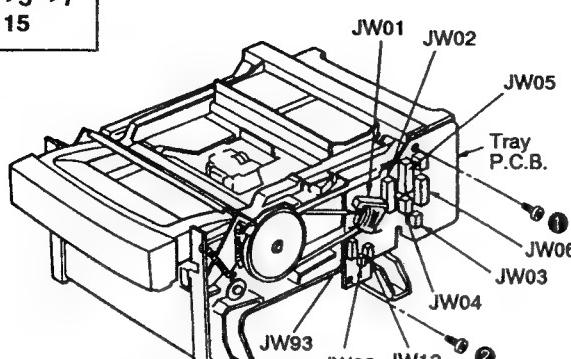
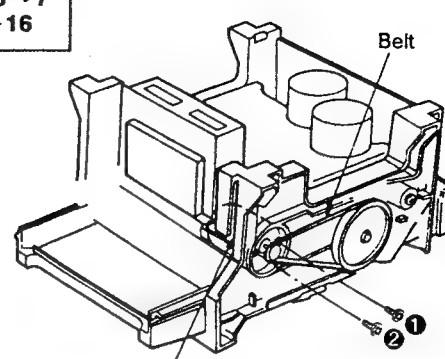
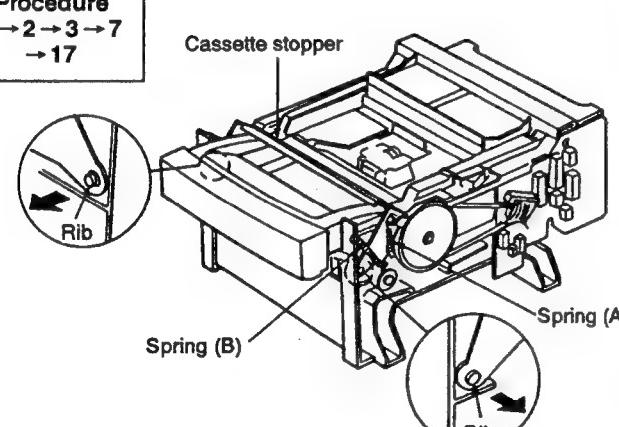
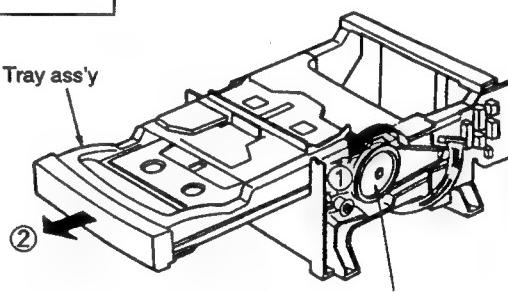
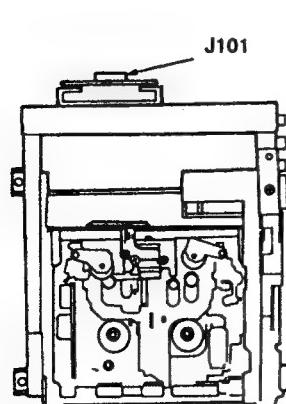
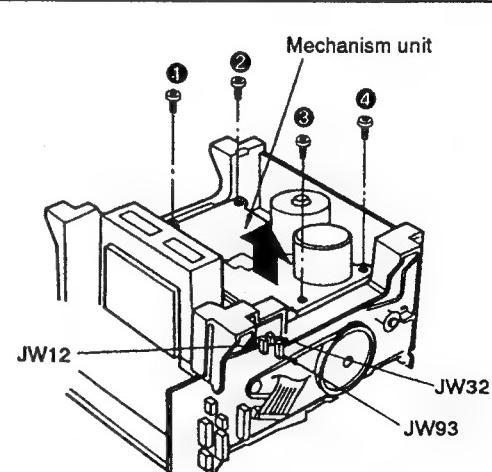
"ATTENTION SERVICER"

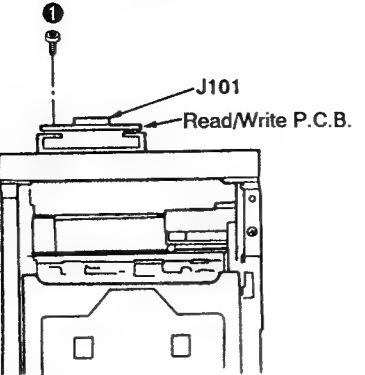
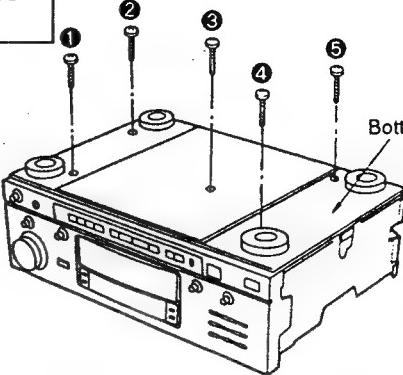
Some chassis components may have sharp edges. Be careful when disassembling and servicing.

Ref.No. 1	Removal of the top cover ass'y	Ref.No. 2	Removal of the P.C.B. cover
Procedure 1	 <ol style="list-style-type: none"> Remove the 7 screws(1 ~ 7). Remove the top cover ass'y in the direction of arrow. 	Procedure 1 → 2	 <ul style="list-style-type: none"> Remove the 2 screws(1 , 2).
Ref.No. 3	Removal of the front panel ass'y		
Procedure 1 → 2 → 3	 <ol style="list-style-type: none"> Remove the 5 connectors(JU02,JH04,JH06,J601,J702). Remove the 4 screws(1 ~ 4). 		 <ol style="list-style-type: none"> Remove the 2 claws. Remove the front panel ass'y in the direction of arrow.
Ref.No. 4	Removal of the rec level/balance P.C.B.	Ref.No. 5	Removal of the headphones level P.C.B.
Procedure 1 → 2 → 3 → 4	 <ol style="list-style-type: none"> Pull out the rec level knob and balance knob. Remove the nut. Remove the 2 screws(1 , 2). 	Procedure 1 → 2 → 3 → 5	 <ol style="list-style-type: none"> Pull out the headphones level knob. Remove the 2 screws(1 , 2). Remove the headphones level P.C.B. in the direction of arrow .

Ref.No. 6	Removal of the operation P.C.B.
Procedure 1 → 2 → 3 → 6	
	 
	<p>1. Remove the 3 knobs.</p> <p>2. Remove the 10 screws(① ~ ⑩).</p> <p>3. Release the 8 claws.</p>
Ref.No. 7	Removal of the loading unit
Procedure 1 → 2 → 3 → 7	
	 
	<p>1. Remove the 4 screws(① ~ ④).</p> <p>2. Remove the loading unit in the direction of arrow.</p> <p>3. Remove the 7 connectors(JM01,JU03,JM04,JM02,JM03, JU01,J408).</p>
Ref.No. 8	Removal of the AD/DA converter P.C.B.
Procedure 1 → 2 → 8	
	
	<ul style="list-style-type: none"> • Remove the AD/DA converter P.C.B. in the direction of arrow.
Ref.No. 9	Removal of the PASC digital P.C.B.
Procedure 1 → 2 → 9	
	
	<p>1. Remove the 1 connector(J408).</p> <p>2. Remove the PASC digital P.C.B. in the direction of arrow.</p>

Ref.No. 10	Removal of the power transformer and voltage selector switch	Ref.No. 11	Removal of the switch rod
Procedure 1 → 10	 <p>1. Remove the 2 connectors(J803,J813). 2. Remove the 6 screws(① ~ ⑥).</p>	Procedure 1 → 2 → 3 → 11	 <ul style="list-style-type: none"> Pull the switch rod with twisting the slots of the ends of the switch rod by flat blade screwdriver.
Ref.No. 12	Removal of the power supply P.C.B.	Ref.No. 13	Removal of the main P.C.B.
Procedure 1 → 2 → 3 → 10 → 11 → 12	 <p>1. Remove the 1 screw(①). 2. Remove the 2 connectors(J821,J851).</p>	Procedure 1 → 2 → 3 → 7 → 8 → 9 → 13	 <p>1. Remove the 6 screws(① ~ ⑥).</p>
Ref.No. 14	Removal of the AC cord		
Procedure 1 → 14	 <p>1. Remove the 1 connector(J851). 2. Remove the cord bushing in the direction of arrow ①. 3. Remove the cord bushing in the direction of arrow ②.</p>		 <p>2. Remove the 1 connector(J821). 3. Remove the 2 screws(⑦, ⑧). 4. Remove the P.C.B. support.</p>

Ref.No. 15	Removal of the tray P.C.B.	Ref.No. 16	Removal of the loading motor
Procedure $1 \rightarrow 2 \rightarrow 3 \rightarrow 7 \rightarrow 15$	 <p>1. Remove the 9 connectors(JW01,JW02,JW03,JW04,JW05, JW06,JW12,JW32,JW93). 2. Remove the 2 screws(①,②).</p>	Procedure $1 \rightarrow 2 \rightarrow 3 \rightarrow 7 \rightarrow 15 \rightarrow 16$	 <p>1. Remove the belt. 2. Remove the 2 screws(①,②).</p>
Ref.No. 17	Removal of the cassette stopper	Ref.No. 18	Removal of the tray ass'y
Procedure $1 \rightarrow 2 \rightarrow 3 \rightarrow 7 \rightarrow 17$	 <p>1. Remove the spring (A) and spring (B). 2. Remove the ribs in the direction of arrow.</p>	Procedure $1 \rightarrow 2 \rightarrow 3 \rightarrow 7 \rightarrow 17 \rightarrow 18$	 <p>1. Roll the pulley in the direction of arrow ①, and draw out the tray. 2. Remove the tray in the direction of arrow ②.</p>
Ref.No. 19	Removal of the mechanism unit		
Procedure $1 \rightarrow 2 \rightarrow 3 \rightarrow 7 \rightarrow 17 \rightarrow 18 \rightarrow 19$	 <p>1. Remove the 1 connector(J101).</p>		 <p>2. Remove the 3 connectors(JW12,JW32,JW93). 3. Remove the 4 screws(①~④). 4. Remove the mechanism unit in the direction of arrow.</p>

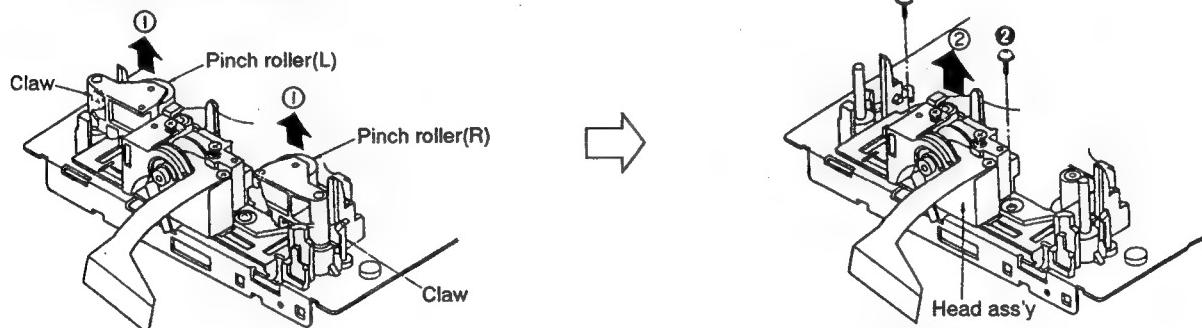
Ref.No. 20	Removal of the Read/Write P.C.B.	Ref.No. 21	Removal of the bottom board
Procedure 1 → 2 → 3 → 7 → 17 → 18 → 20	 <p>1. Remove the 1 connector(J101). 2. Remove the 1 screws(①).</p>	Procedure 1 → 21	 <p>• Remove the 5 screws(①~⑤).</p>

■ HEAD ASS'Y REPLACEMENT

Cautions:

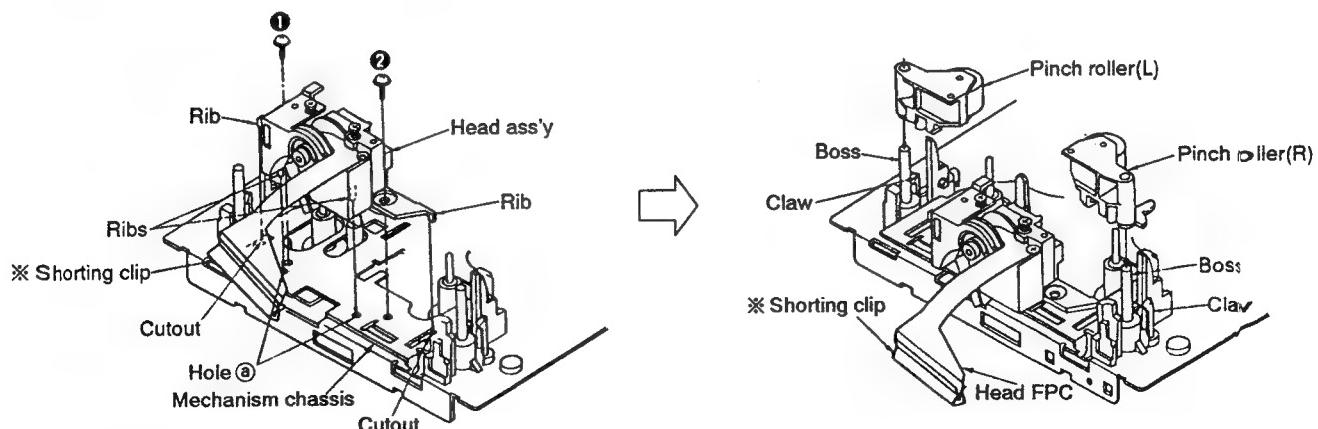
1. Be sure to wear a grounding wrist band whenever you touch the head assemblies.(RFKZ0036)(See page 13.)
2. When removal the "Head Ass'y" use a unmagnetized adjusting screwdriver.(RFKZ0037)(See page 13.)

● DISASSEMBLY INSTRUCTION



1. Release the 2 claws and remove the Pinch roller(L),(R) in the direction of arrow ①.
2. Remove the 2 screws(①,②).
3. Remove the head ass'y in the direction of arrow ②.

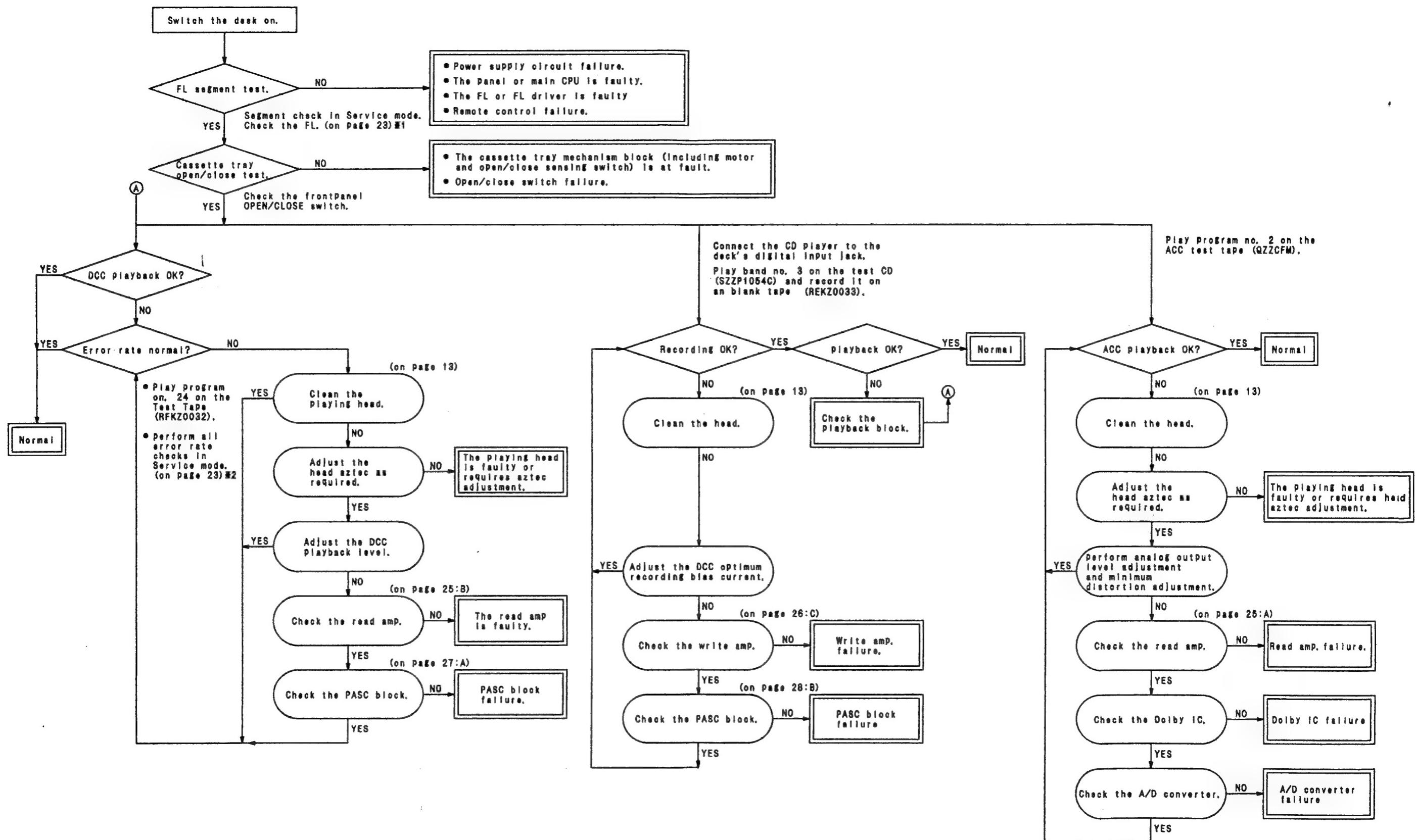
● REASSEMBLY INSTRUCTION



1. Align the 4 ribs of head ass'y to the two holes③ and two cutouts in the mechanism chassis.
2. Fix the 2 screws(①,②)to the head ass'y.
3. Fix the 2 Pinch roller(L),(R) to each boss on the mechanism chassis.
(Press the pinch rollers until it is secured by the claw on the mechanism chassis.)

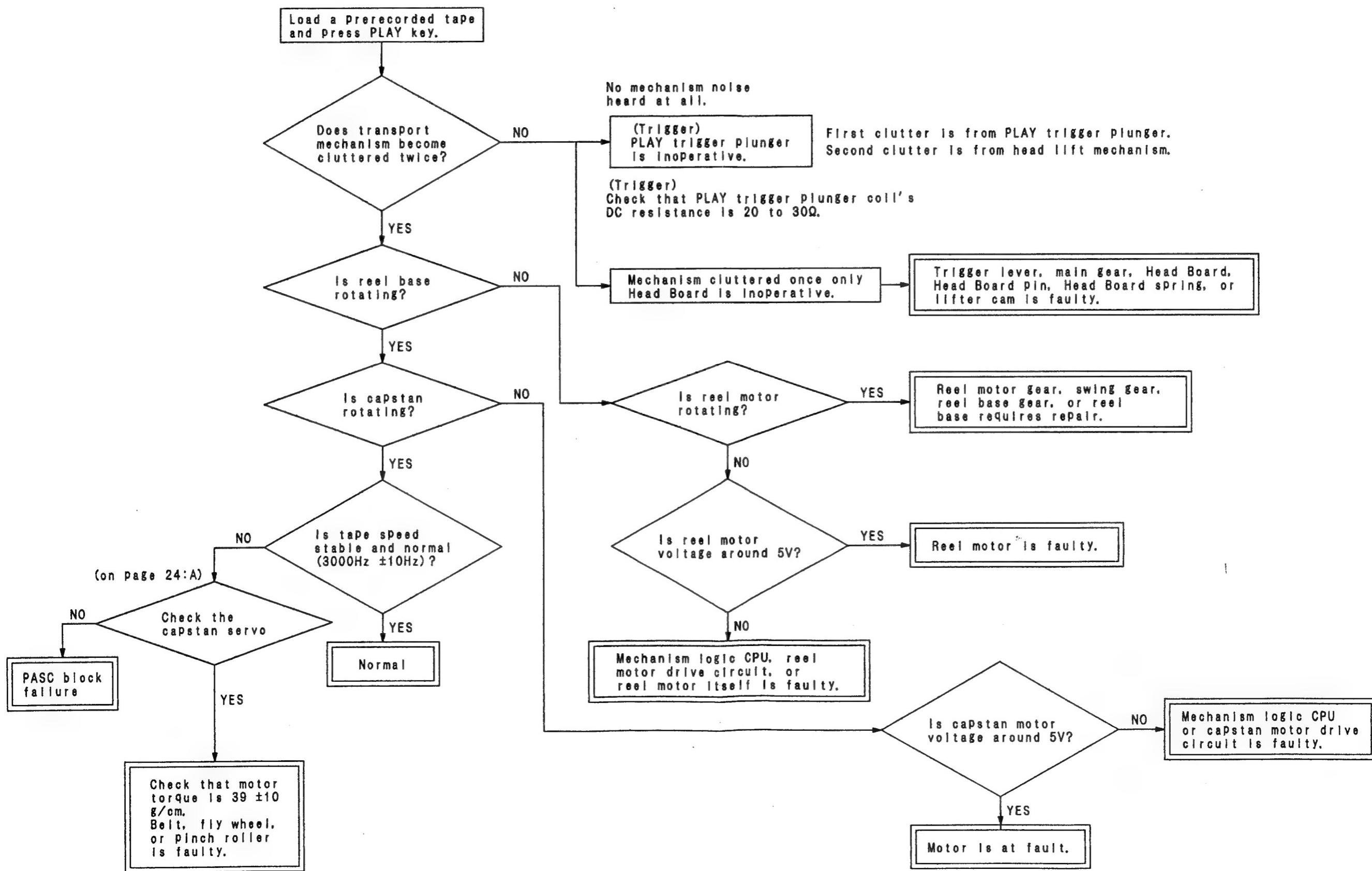
* • Only remove the shorting clip on the head FPC if the Read/Write P.C.B. connector (J101) is connected.
• After the shorting clip is removed, make connection to the connector (J101) as soon as possible.

■ OPERATIONAL CHECKING PROCEDURE



MECHANISM BLOCK CHECK

(Remount on defective mechanism block. Connect extention cords to pins 9, 10, and 11 and connect extention FPC.)

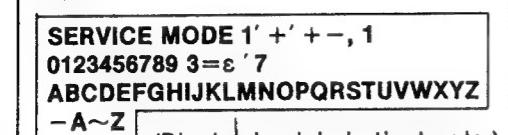


■ HOW TO USE "SERVICE MODE"

• Test procedure by function of "Service Mode".

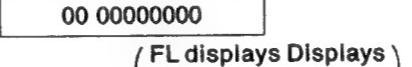
This unit provides "Service Mode" function by which the segment test, FL test (*1) and the "ALL ERROR RATE" inspection (*2) can be performed.

*1

1. Setting at Service Mode
To select Service mode, switch on the unit while holding down the **STOP** and **PLAY** keys.
2. Segment Test
The following characters are displayed in sequence

(Display in alphabetical order)
3. FL Test
Press the **COUNTER** key
All FL segments are lit up and the **PLAY** (green) and **REC** (red) LEDs on the operation panel, come on.

*2

- (Press the counter key until "ALL ERROR RATE" is displayed.

(FL displays)
- 
(FL displays Displays of ten figure)

• Pass/Reject Condition from All Error Rate

Display	Condition	Remedy
"00000000" is constantly displayed for all tracks.	Normal (OK)	—
"01101000" is momentarily displayed for any one to three tracks (or more).	Normal (OK)	—
"11111111" is constantly displayed for one to three tracks (or more).	Error	<p>Clean head with alcohol. (on page 13.)</p> <p>Check playback signal envelope at J103-pin 7.</p> <p>Adjust DCC playback level if the envelope amplitude (V_{p-p}) is too small.</p> <p>If the envelope amplitude is not at 12V_{p-p} ± 100mV, a problem exists in the head or read amplifier.</p> <p>Check head assembly.</p>
"11111111" is constantly displayed for all tracks.	Error	<p>If the head assembly is normal, the read amplifier is most likely at fault.</p> <p>Refer to the content of "Read/Write P.C.B. check" on pages 25, 26.</p>
"FFFFFFF" is constantly displayed for all tracks.	Error	

■ ABOUT THE OPERATIONAL CHECKING POINTS

Capstan Servo Check

A) DCC Playback System

1. Connect an oscilloscope to J411 pin 3 (motor speed TP) on the PASC digital P.C.B. as shown in the figure below (connect the scope's ground lead to the chassis ground).
2. Load a **DCC music tape (RFKZ0034)** into the unit under test and put the unit **IN PLAY mode**. When the capstan servo is locked, a **47Hz square wave with a duty ratio variation of less than 0.5μs** will be observed on the scope (see Fig. 1). Unlock the servo and verify that the muting function is active.

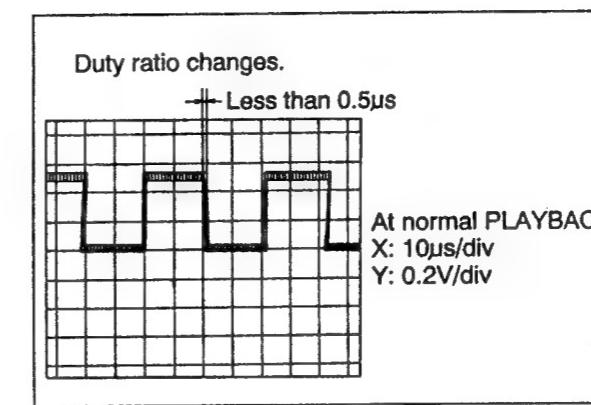


Fig. 1

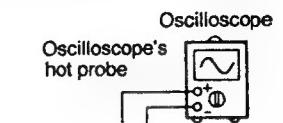


Fig. 2

B) DCC Record System and ACC Playback System

1. Set up the unit as described in paragraph 1 above.
2. Load a **DCC blank tape (RFKZ0033)** into the unit under test and put the unit **IN REC mode**. Verify that a continuous **47Hz square wave with a 50 percent duty ratio** is observed on the scope (see Fig. 3). This is the normal result. Also verify that the same waveform is observed when a prerecorded ACC tape is played.

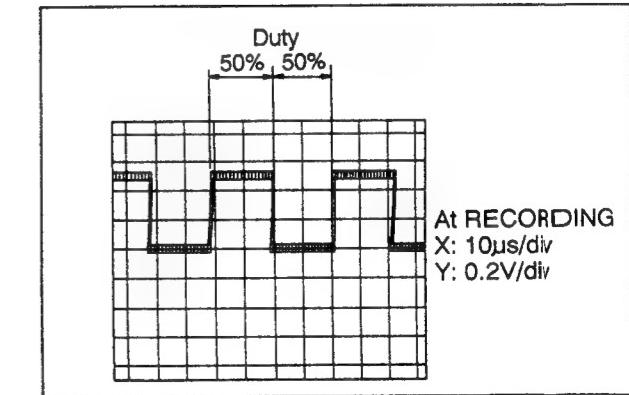


Fig. 3

Read/Write P.C.B. Check**A) ACC Playback System**

1. Connect an oscilloscope to J103 pin 18 (analog L-channel) or 16 (analog R-channel) on the Read/Write P.C.B. (connect the probe's ground lead to the chassis ground).
2. Play a prerecorded ACC tape.
3. Verify that the waveform changes as shown below when the unit is switched from STOP mode to PLAY mode.

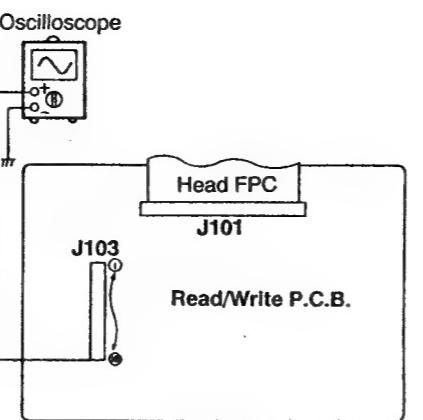


Fig. 4

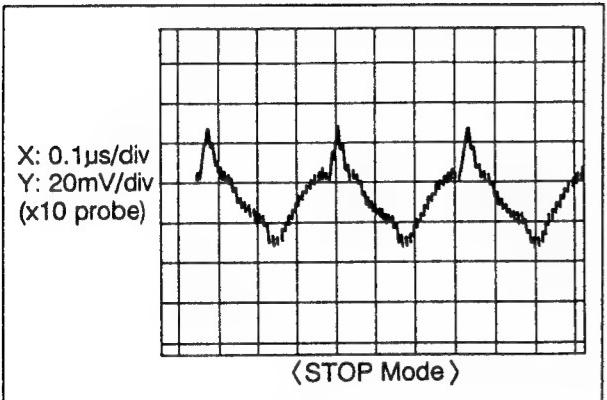


Fig. 5

Approx. 3 MHz in STOP mode
An AC bias is applied to suppress 600mVp-p noise inherent to the MR head.

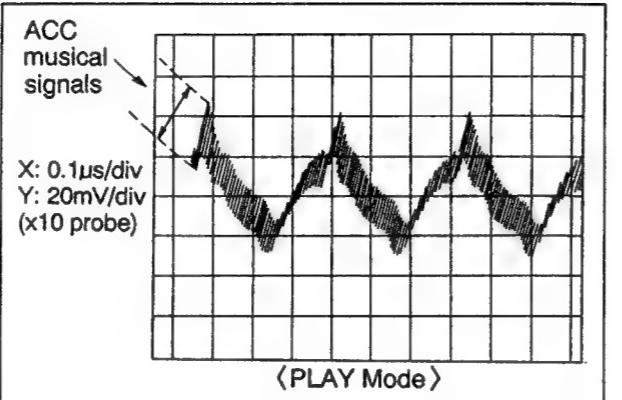


Fig. 6

During playback musical signals are superimposed on the AC bias.

B) DCC Playback System

1. Connect a dual-beam oscilloscope's CH. 1 probe to J103 pin 9 (RD Clock) on the Read/Write P.C.B. (connect the probe's ground lead to the chassis ground).
2. Connect the scope's CH. 2 probe to J103 pin 11 (RD Sync).
3. Play a DCC music tape (RFKZ0034).
4. Verify that the waveform shown below is observed on the scope.

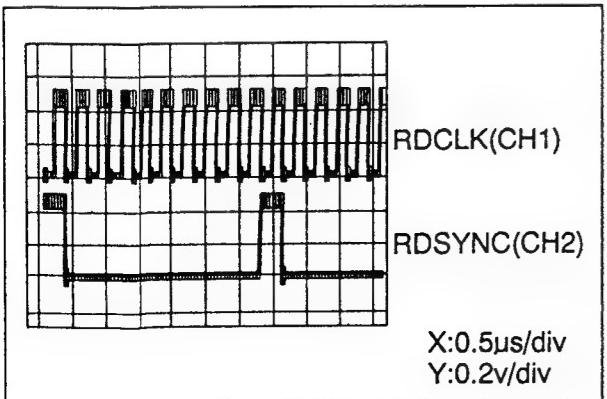


Fig. 7

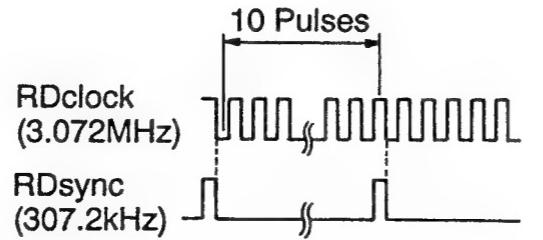


Fig. 8

5. Connect an oscilloscope's CH. 1 probe to J103 pin 7 (RD Mux) on the Read/Write P.C.B. (connect the probe's ground lead to the chassis ground).
6. Connect the scope's CH. 2 probe to J103 pin 11 (RD Sync).
7. Play a DCC music tape (RFKZ0034).
8. Verify that the waveform shown below is observed on the scope.

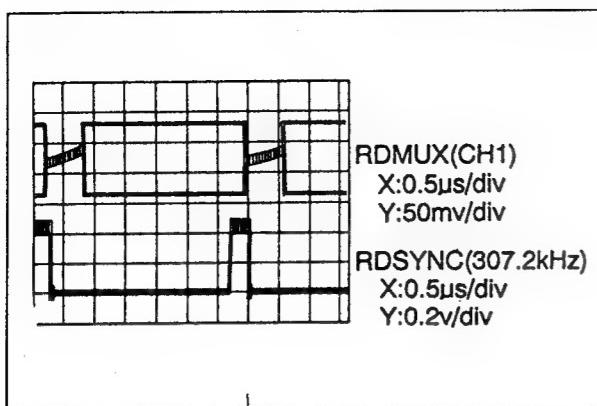


Fig. 9

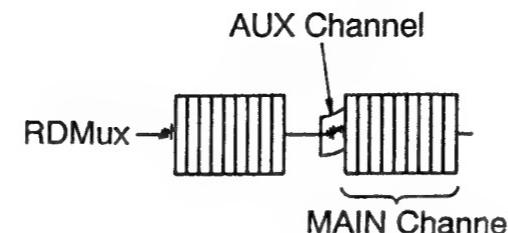


Fig. 10

C) DCC Recording System

9. Connect the dual-beam oscilloscope's CH. 1 probe to J103 pin 5 (WCLK) on the Read/Write P.C.B. (connect the probe's ground lead to the chassis ground).
 10. Connect the scope's CH. 2 probe to J103 pin 3 (WDATA).
 11. Play a DCC blank tape (RFKZ0033).
- Verify that the waveform shown next page is observed on the scope.

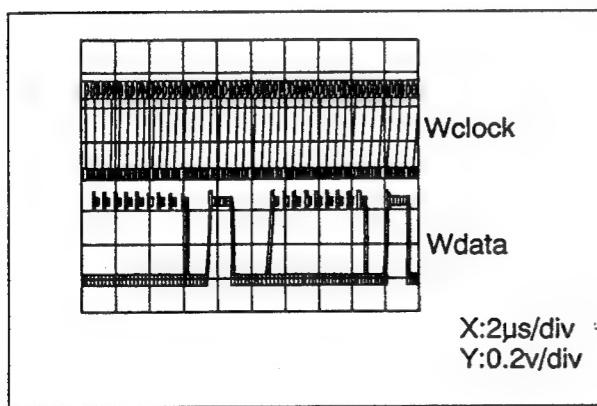


Fig. 11

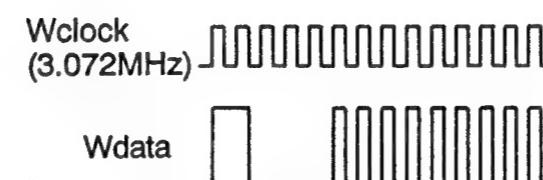


Fig. 12

— If adjustment failed, it is most probable that —

- (1) Q101, Q105, Q106, or Q151 on the Read/Write P.C.B. (or any combination thereof) is defective.
- (2) The head is contaminated. Clean the head with alcohol. (Follow the same cleaning procedure as for ACC decks.)

PASC Digital P.C.B. Check**A) Play Mode Check**

- Checking the Input Signal Waveforms

1. Play program no. 34 on the Test Tape (RFKZ0032).

Connect an oscilloscope to J408 pin 7 on the PASC Digital P.C.B. and check for the following input signal waveforms (connect the scope's ground lead to the chassis ground).

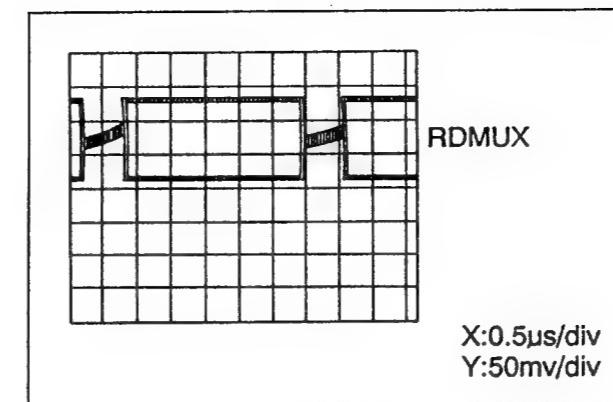


Fig. 13



Fig. 14

- Checking the Output Signal Waveforms

1. Check the output waveforms at pin 42 (connect to the scope's ch. 1 probe) and pin 50 (connect to the scope's ch. 2 probe) of connector J421, which connects the PASC Digital P.C.B. to the Main P.C.B.
2. Play program no. 34 on the Test Tape (RFKZ0032) and observe the output signal waveforms. Play program no. 47 on the same tape and check to make sure that the following output waveforms are observed.

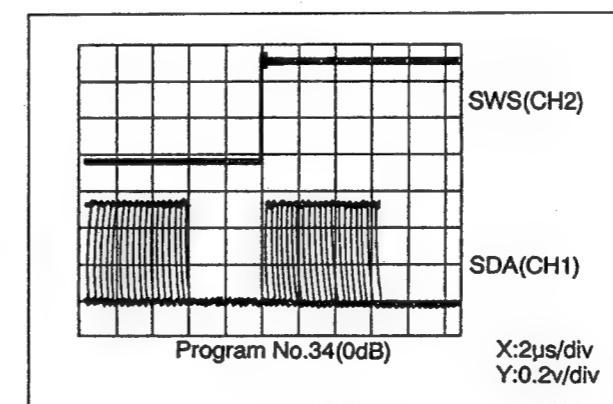


Fig. 15

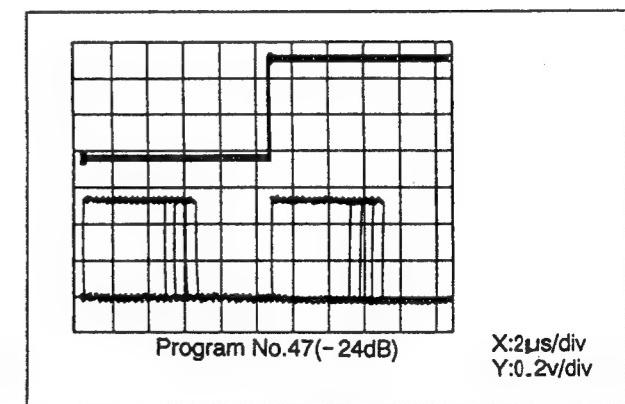


Fig. 16

The playback system is functioning normally if the specified input and output waveforms are obtained at the test points.

B) Recording Mode Check

Feed the CD player output to the DIGITAL REC IN/COAXIAL jack on the DCC deck.

- **Checking the Input Signal Waveforms**

1. Connect the oscilloscope to the same test points as those used to check the playback output signal.
2. Load an DCC blank tape (RFKZ0033) into the DCC deck. Play Track 1 and 3 on the test CD (SZZP1054C) and place the deck in REC mode to record the CD test programs.
3. Check for the following input signal waveforms at the test points.

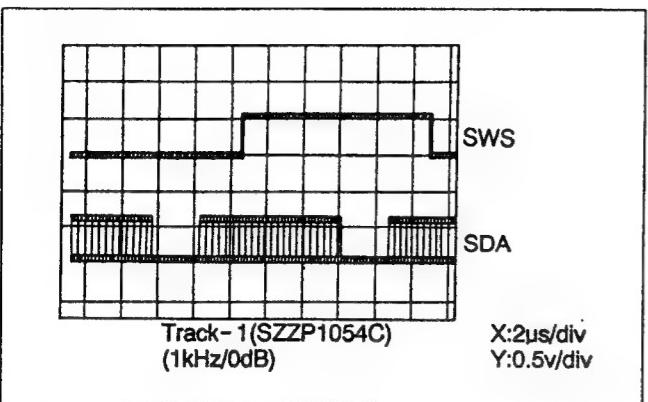


Fig. 17

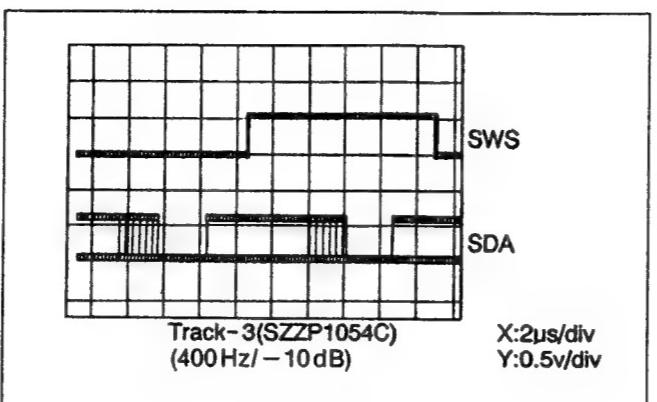


Fig. 18

- **Checking the Output Signal Waveforms**

1. Connect an oscilloscope to J408 pin 3 on the PASC Digital P.C.B. and check for the following output signal waveforms (connect the scope's ground lead to the chassis ground).

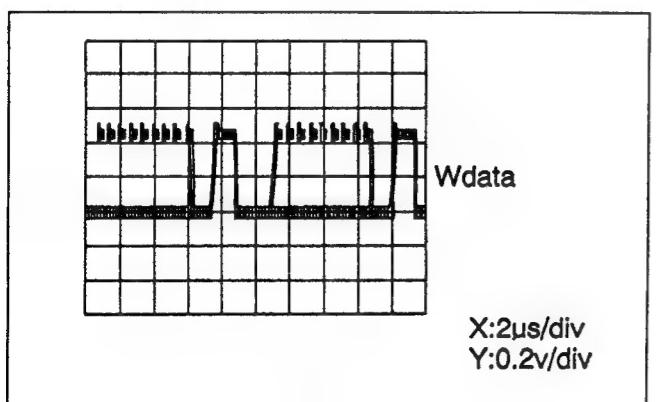


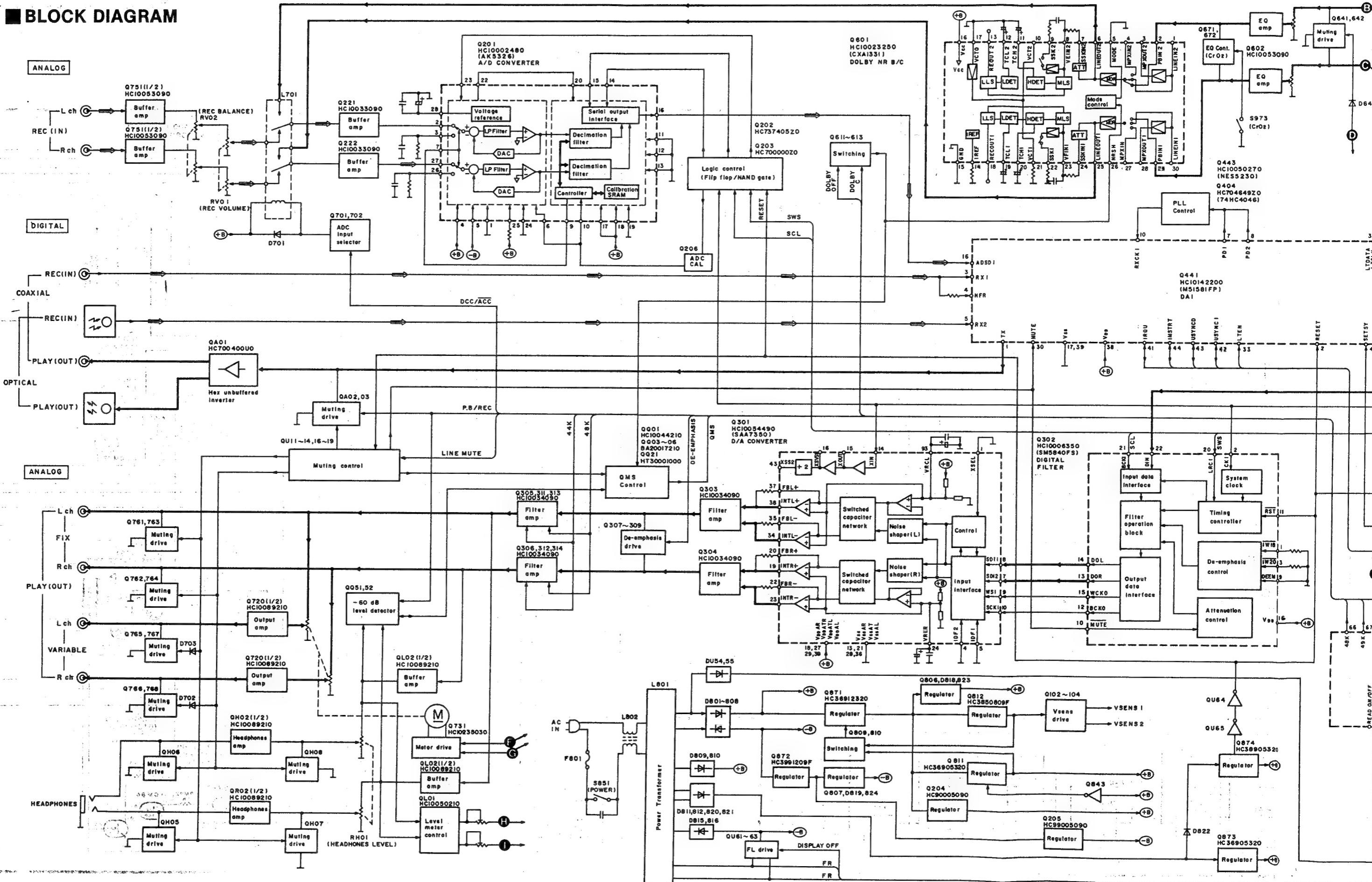
Fig. 19

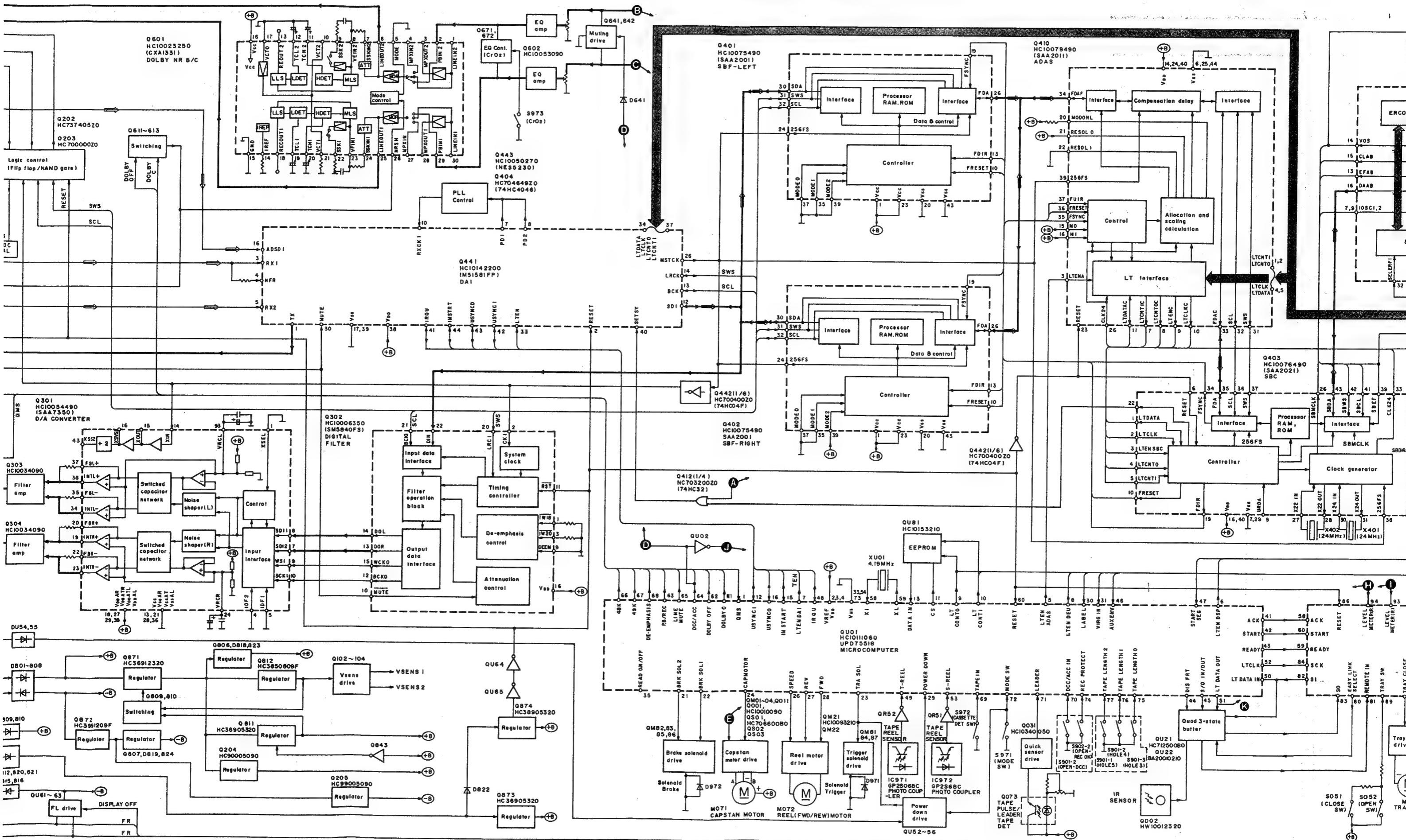


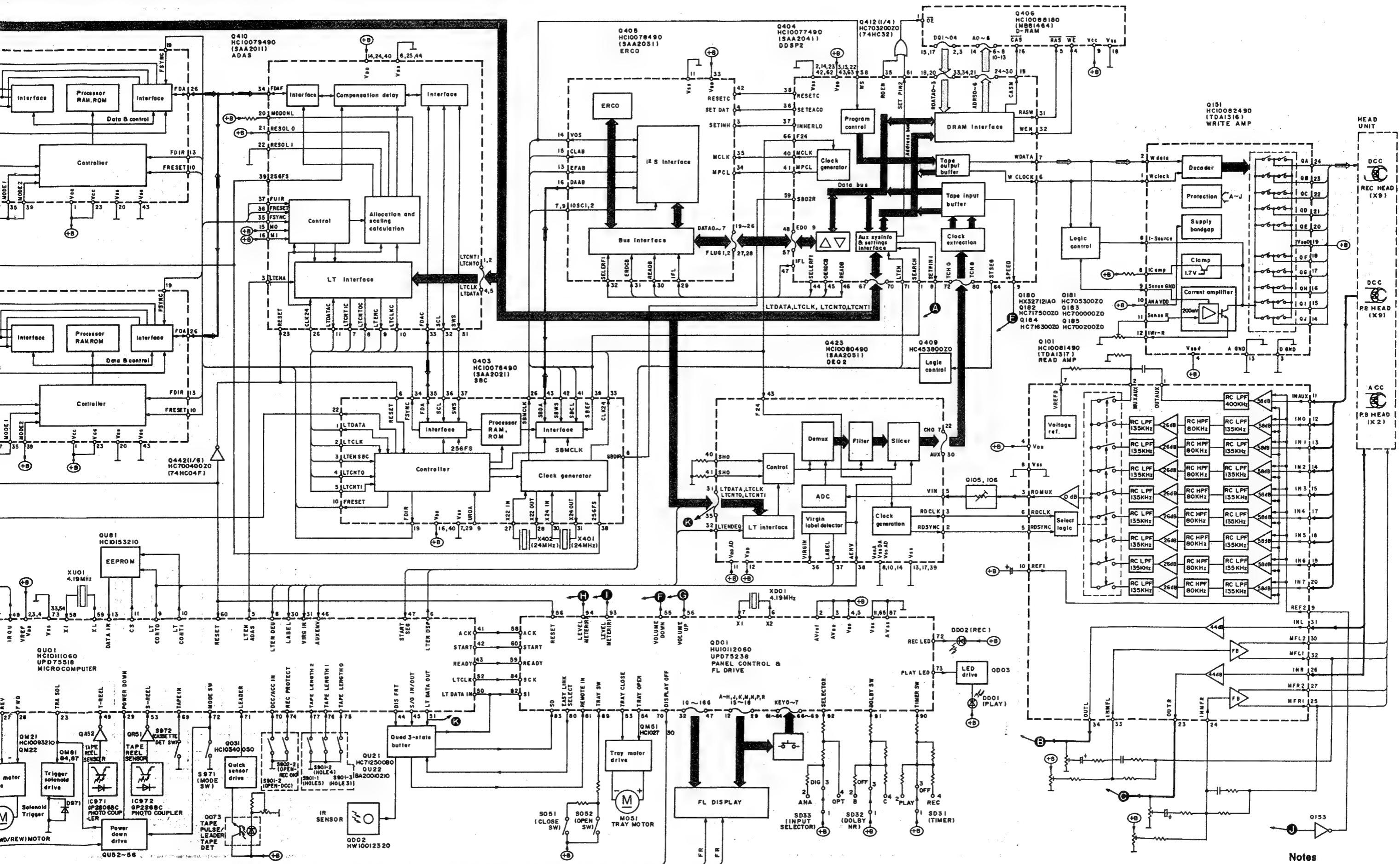
Fig. 20

The recording system is functioning normally if the specified input signal waveforms are obtained at the test point.

BLOCK DIAGRAM





**Notes**

- Playback signal
- Recording signal

SCHEMATIC DIAGRAM

(Parts list on pages 67~74.)

(This schematic diagram may be modified at any time with development of new technology.)

Note 1:

- J091 : Voltage selector in "240V" position.
(110V ↔ 120V ↔ 240V ↔ 220V)
- S851 : Power switch in "on" position (POWER/ OFF ON).
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
1K = 1,000 (Ω), 1M = 1,000k (Ω)
- Capacity are in micro-farads (μF) unless specified otherwise.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.

..... Voltage values at record mode.

For measurement us EVM.

Important safety notice

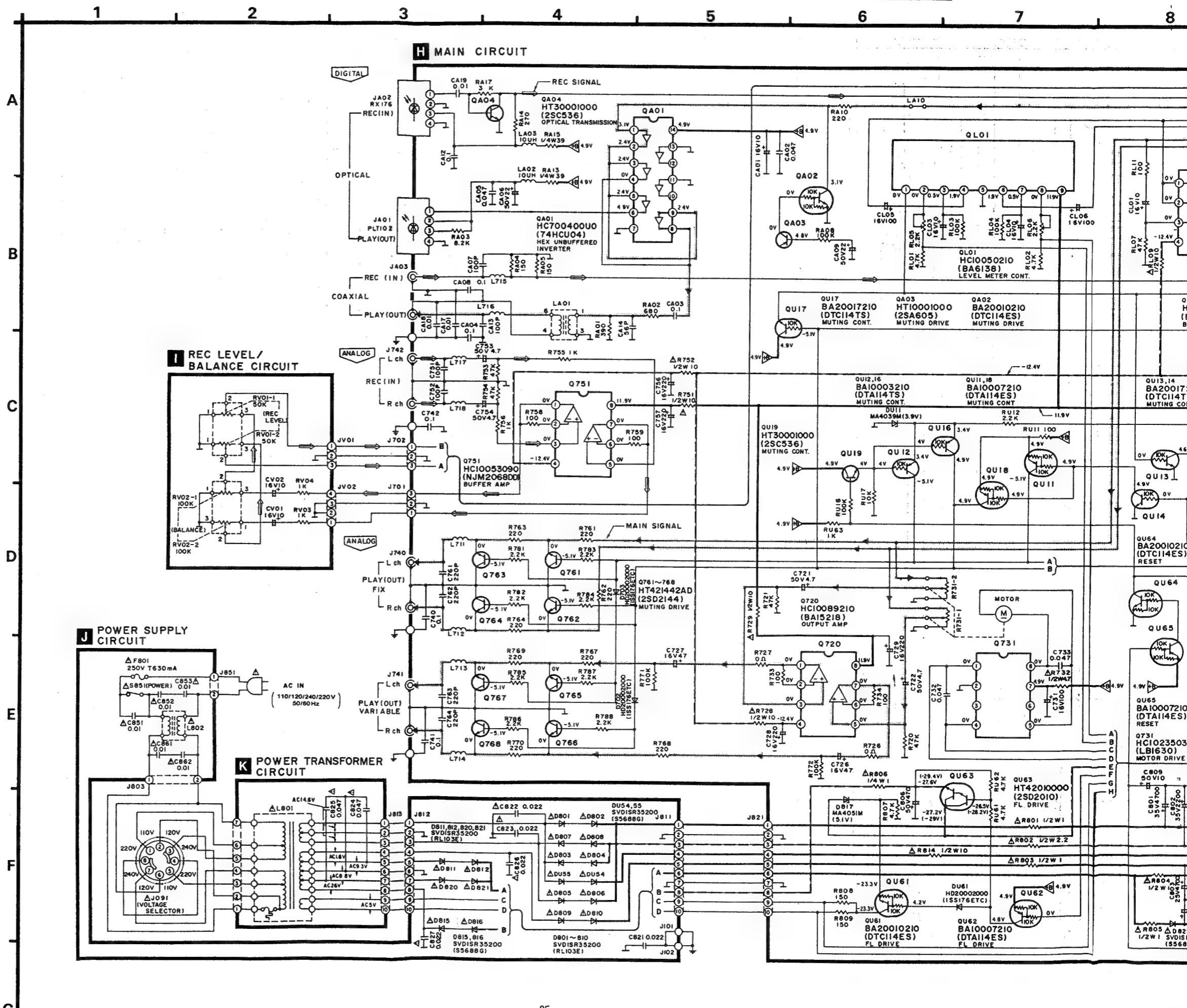
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

- (Δ +B) Indicates +B (bias).
- (Δ -B) Indicates -B (bias).
- (Δ \rightarrow) indicates the flow of the playback signal.
- (Δ \leftarrow) indicates the flow of the record signal.

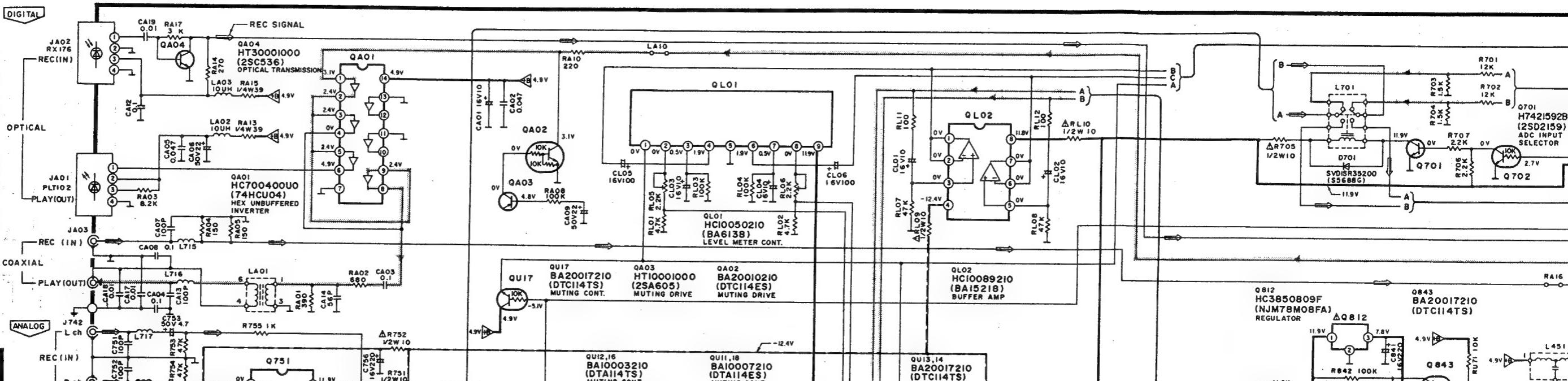
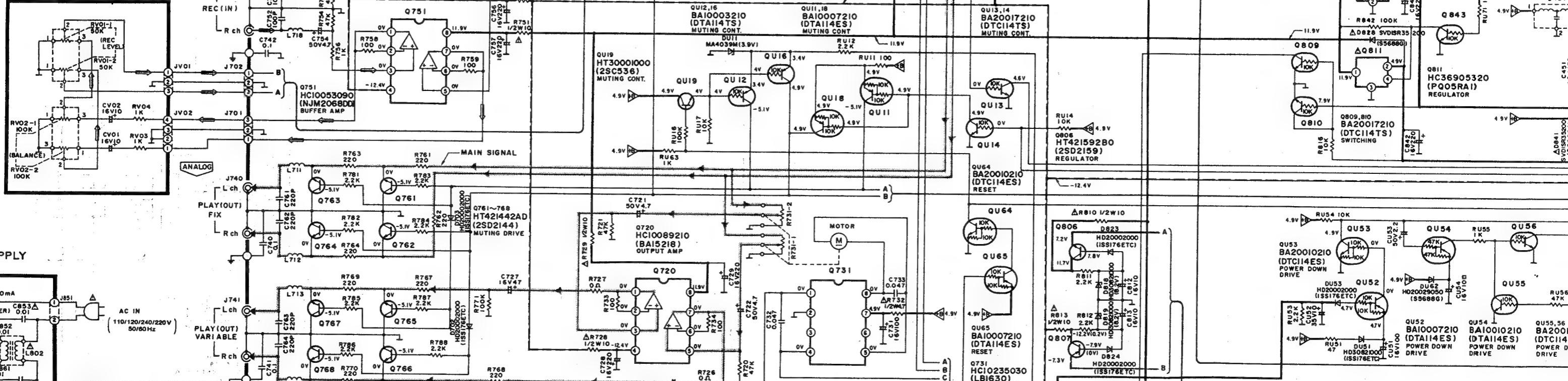
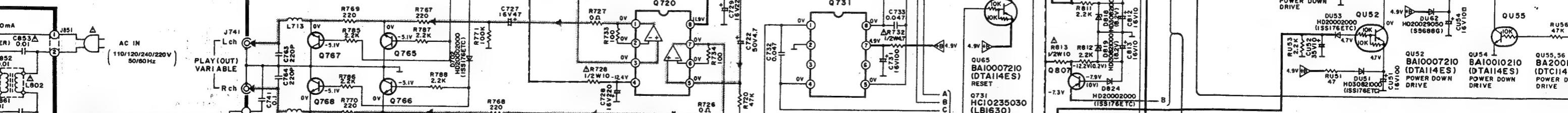
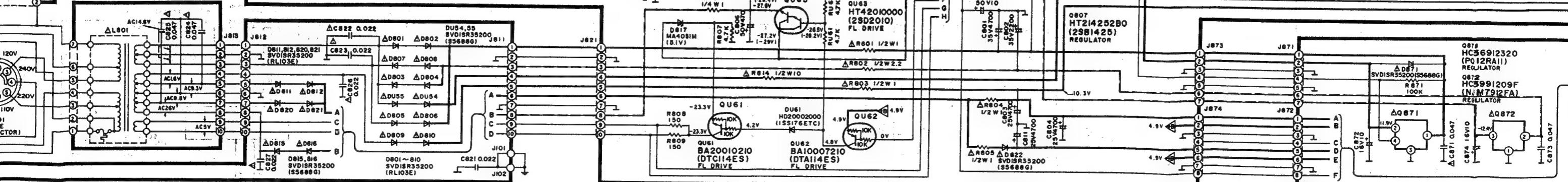
Caution!

IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.



2 3 4 5 6 7 8 9 10 11

H MAIN CIRCUIT**I REC LEVEL/BALANCE CIRCUIT****J POWER SUPPLY CIRCUIT****K POWER TRANSFORMER CIRCUIT****L REGULATOR CIRCUIT**

10

11

12

13

14

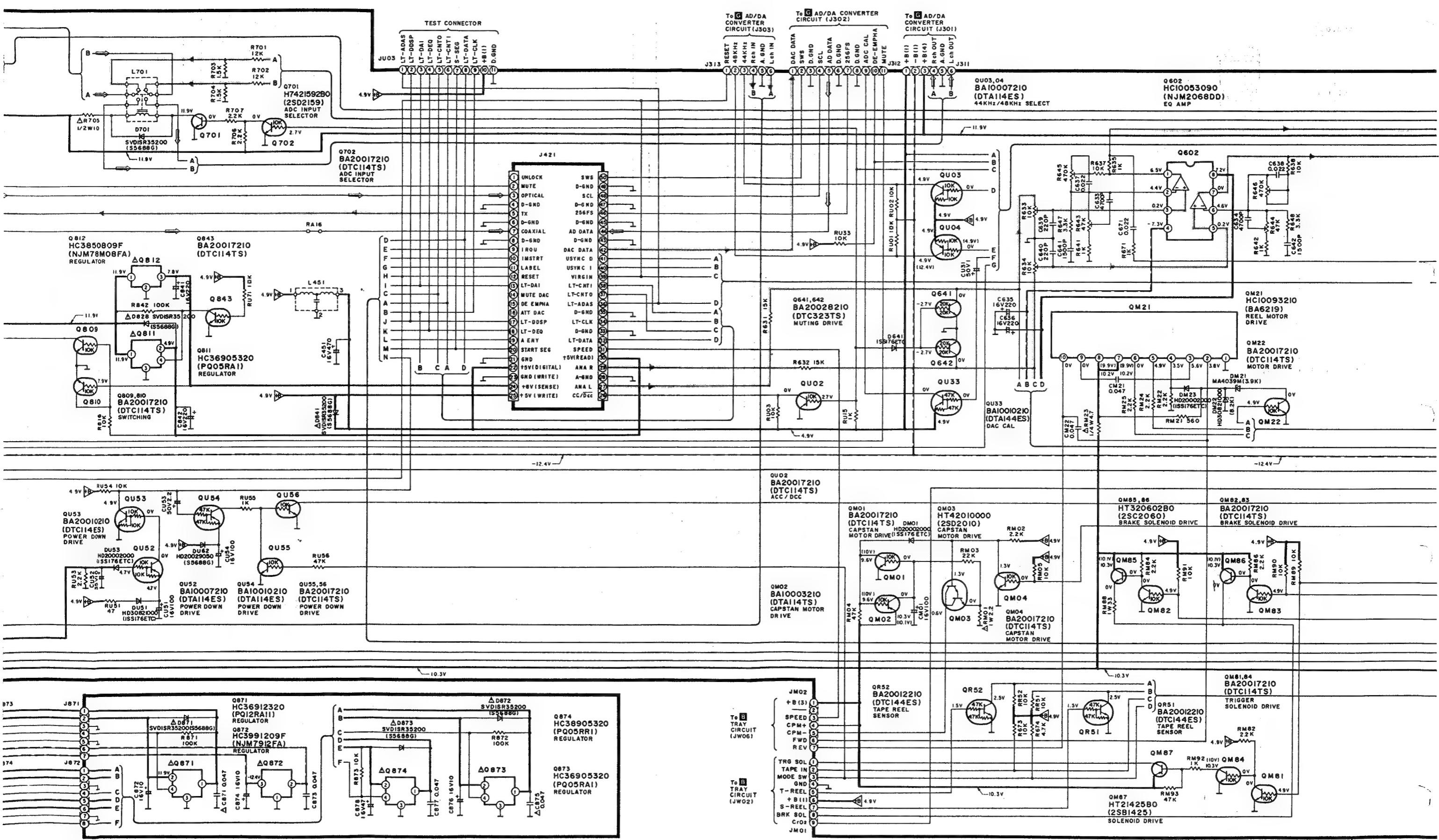
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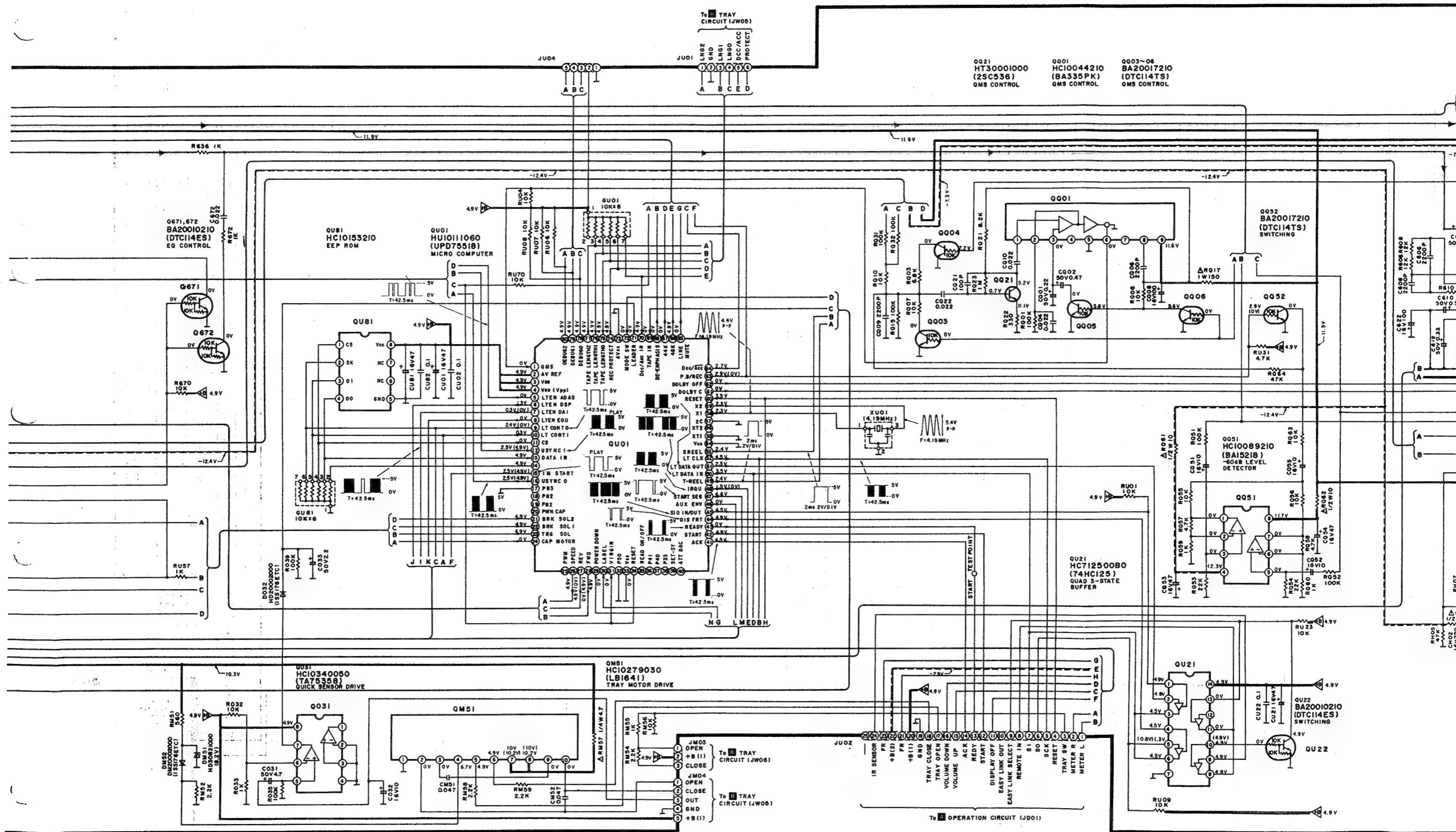
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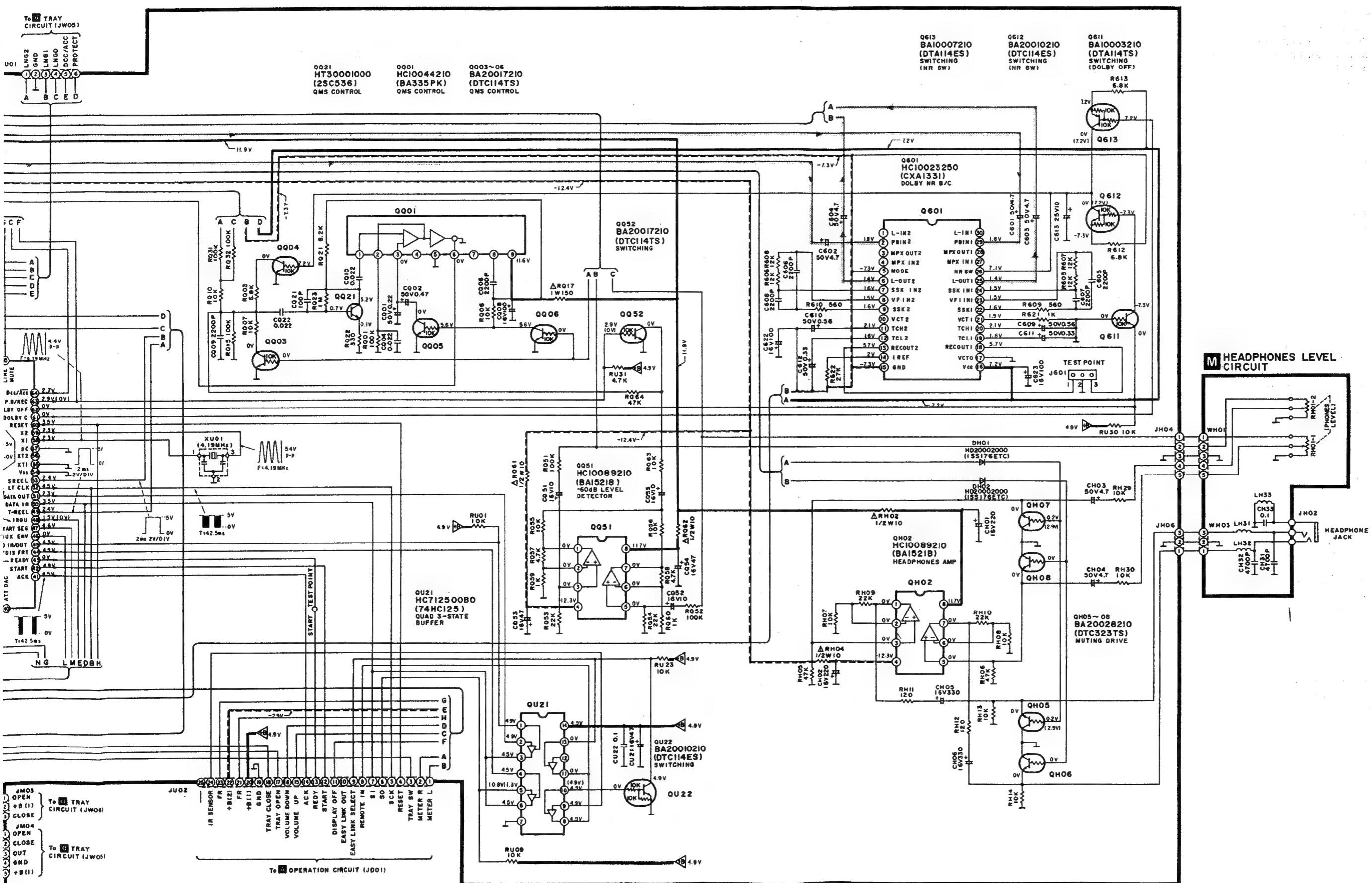
17

18

19







1 2 3 4 5 6 7 8 9 10

A

Note 3:

- S051 : Cassette tray close detection switch.
- S052 : Cassette tray open detection switch.
- S901-1~S901-3: Tape playing time detection switch.
- S902-1: DCC/ACC Tape detection switch in "DCC" position.
- S902-2: DCC Rec detection switch in "DCC REC" position.
- S971 : Mechanism Play/Stop Mode switch in "stop" position.
- S972 : Cassette half detection switch.
- S973 : ATS (Normal-CrO₂/Metal) selector switch in "normal" position.
- SD01 : Repeat switch (REPEAT).
- SD02 : Tape travel selector switch (SIDE A/B).
- SD03 : Rewind switch (REW ▲▲).
- SD04 : Fastforward switch (FF ▶▶).
- SD05 : Skip switch (SKIP ▲◀).
- SD06 : Skip switch (SKIP ▶▶).
- SD07 : Play switch (PLAY ▶).
- SD08 : Stop switch (STOP ■■).
- SD09 : Append switch (APPEND ▶■■).
- SD10 : Renumber switch (RENUMBER).
- SD11 : MKR erase switch (MKR ERASE).
- SD12 : Next MKR write switch (NEXT MKR WRITE).
- SD13 : Reverse MKR write switch (REVERSE MKR WRITE).
- SD14 : Start MKR write switch (START MKR WRITE).
- SD15 : Pause switch (PAUSE ■■).
- SD16 : Record switch (REC ●).
- SD17 : Cassette tray open/close switch (OPEN/CLOSE).
- SD19 : Counter reset switch (COUNTER RESET).
- SD20 : Text information selector switch (TEXT).
- SD21 : Counter selector switch (COUNTER).
- SD23 : Auto start MKR switch (AUTO START MKR).
- SD24 : Recording mute switch (AUTO REC MUTE ●).
- SD31 : Timer switch "off" position (TIMER).
- SD32 : Dolby NR selector switch (DOLBY NR).
- SD33 : Input selector switch (INPUT SELECTOR).
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
1K=1,000 (Ω), 1M=1,000k (Ω)
- Capacity are in micro-farads (μF) unless specified otherwise.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.

()..... Voltage values at record mode.

For measurement us EVM.

Important safety notice

Components identified by △ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

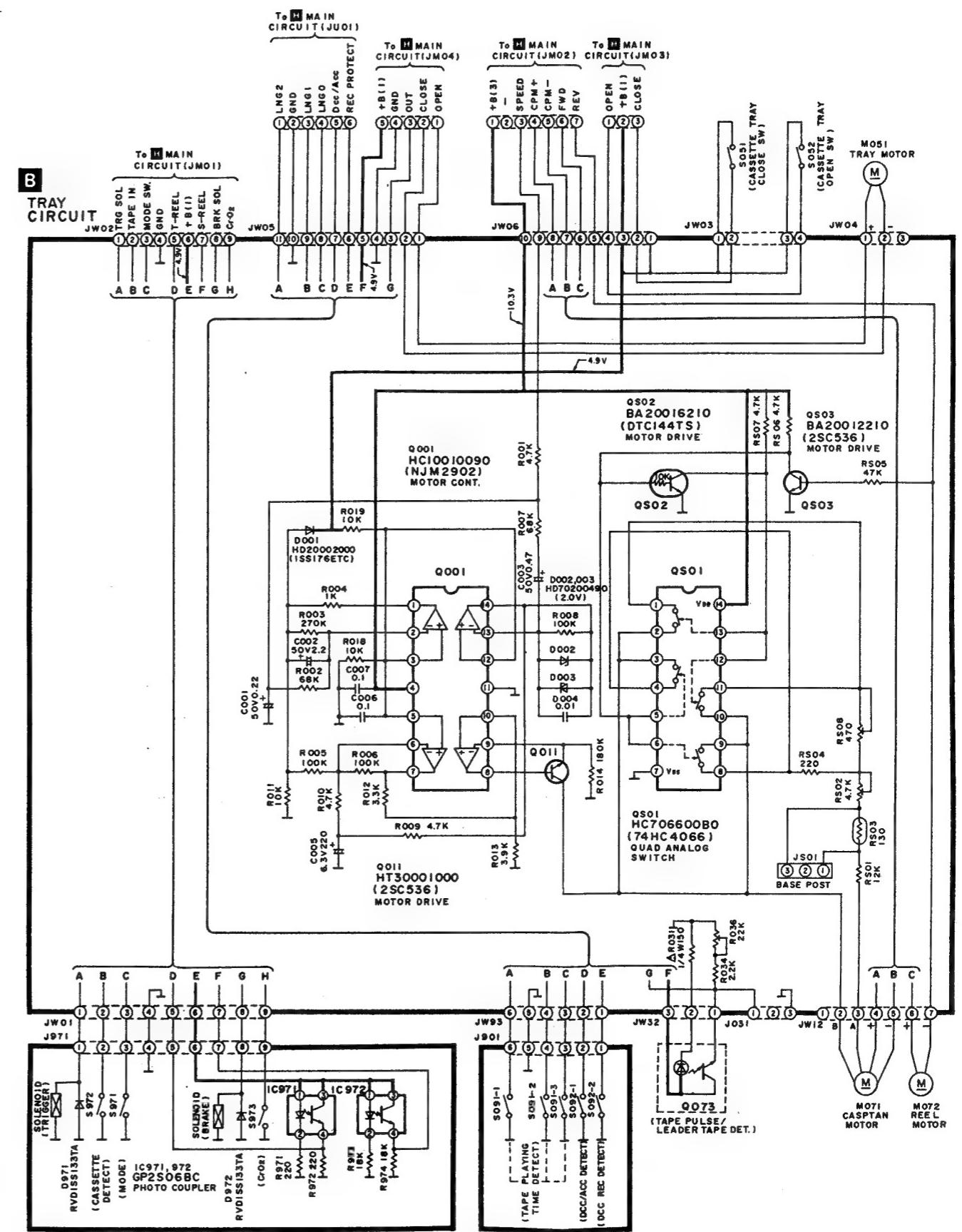
- (—> +B —>) indicates +B (bias).
- (—< -B —) indicates -B (bias).
- (—> —>) indicates the flow of the playback signal.
- (—> —>) indicates the flow of the record signal.

Caution!

IC and LSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.



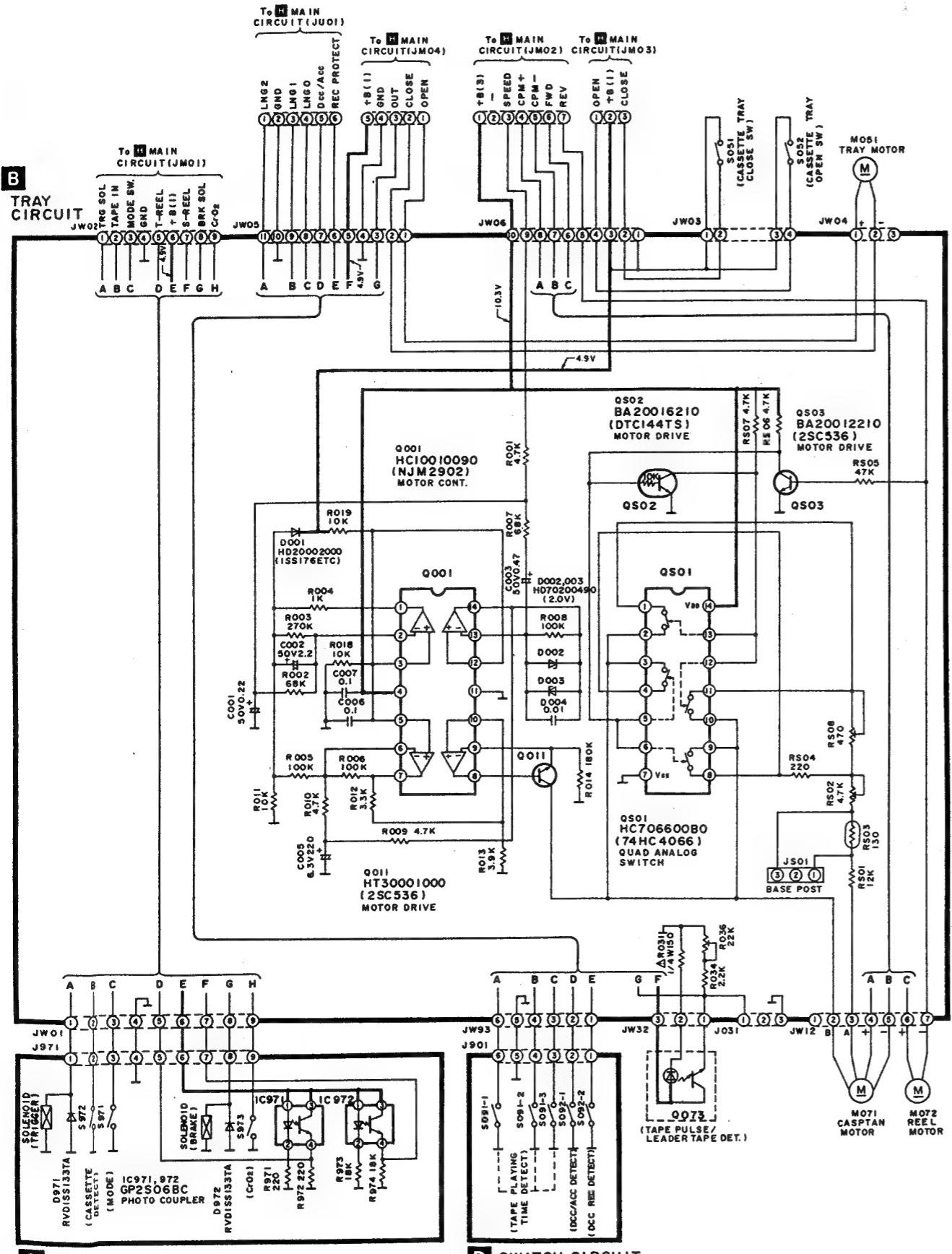
A OPER

SD
(DOLBY)
SD
(DOLBY)
SD
(INPUT)
SELECT

R
E
L
F=4.19MHZ
A
B
C
D
E
F
G
H
I
J
K
L

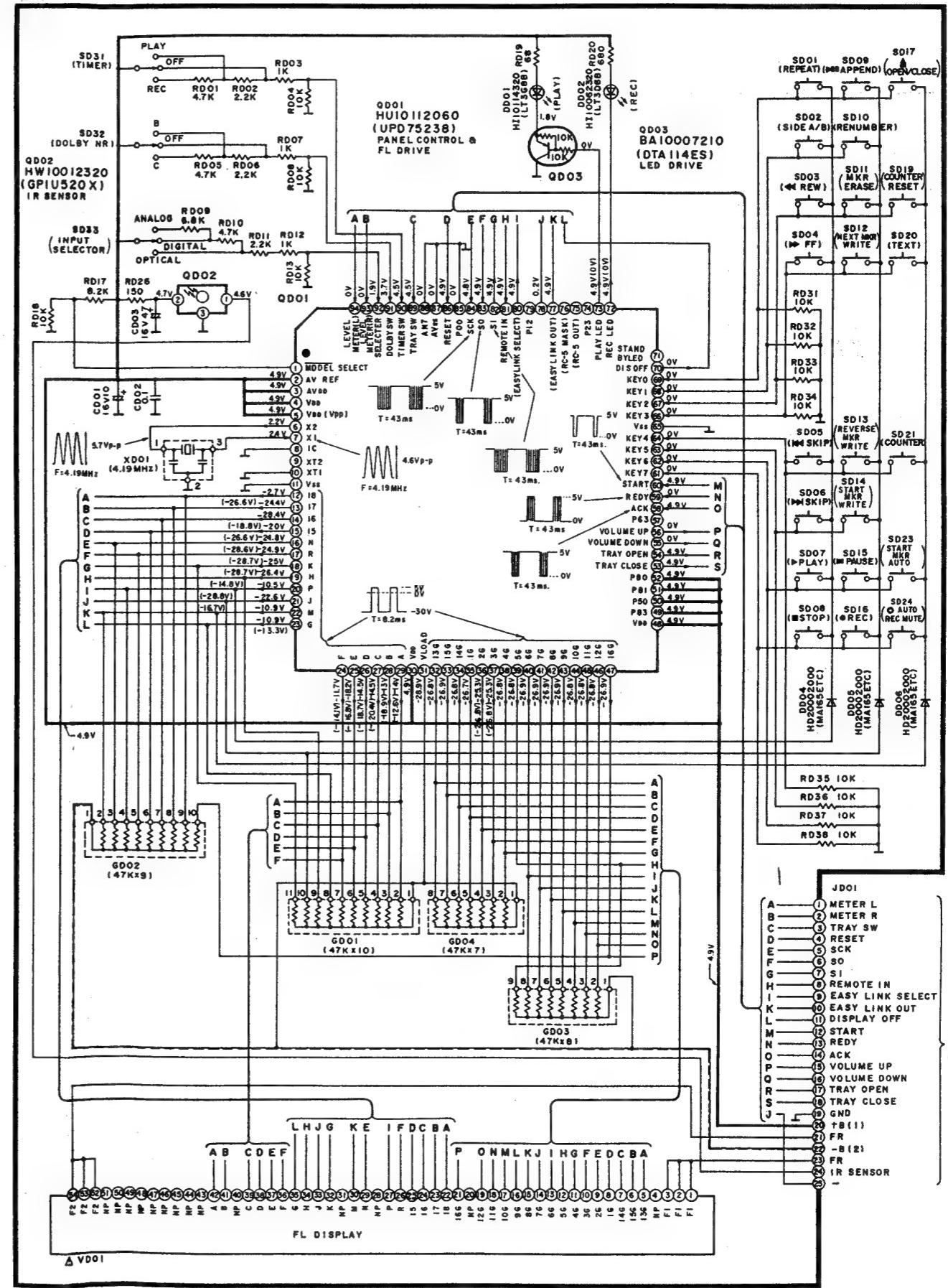
R
E
L
F=4.19MHZ
A
B
C
D
E
F
G
H
I
J
K
L

A OPERATION CIRCUIT

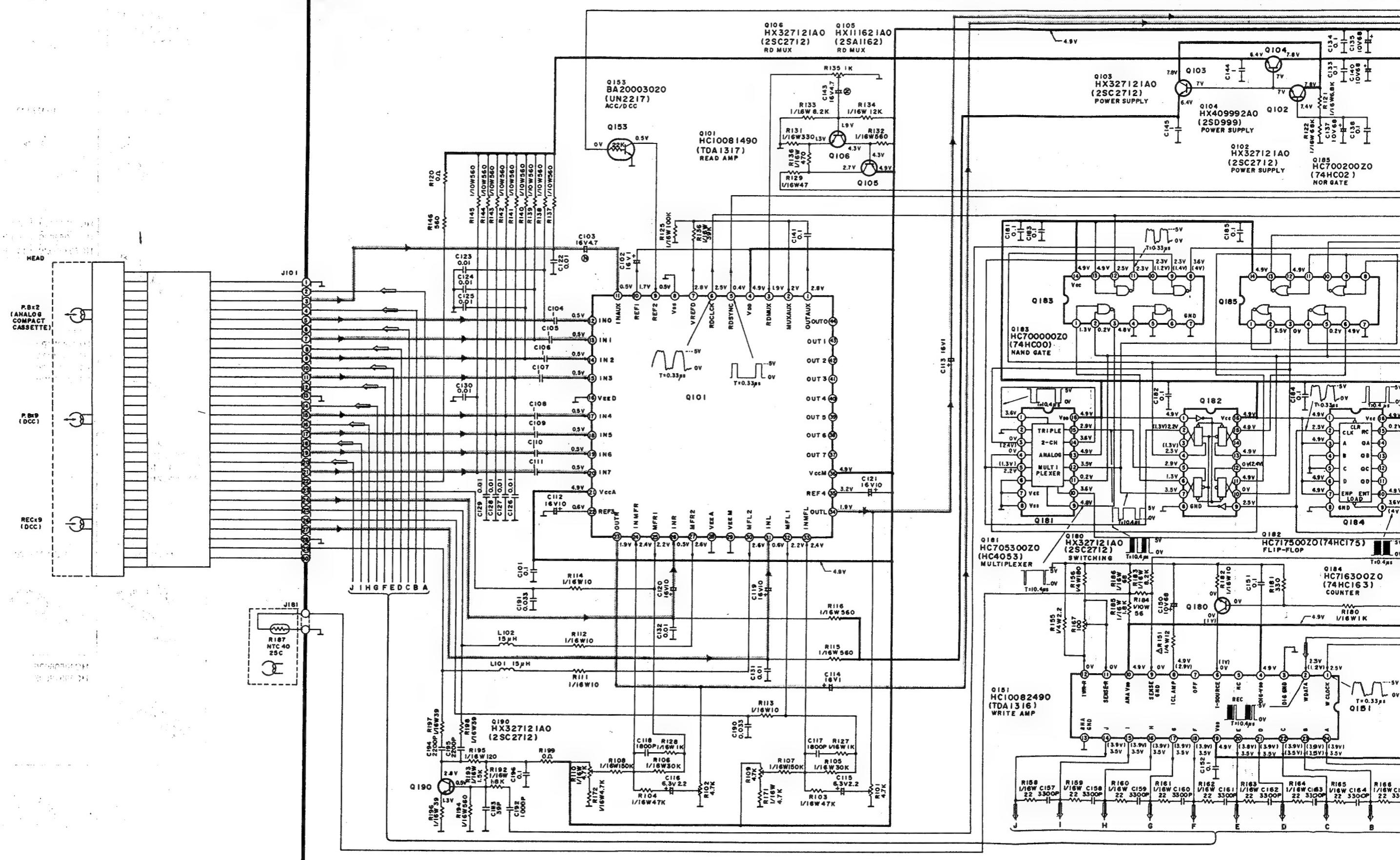


C MECHANISM CIRCUIT

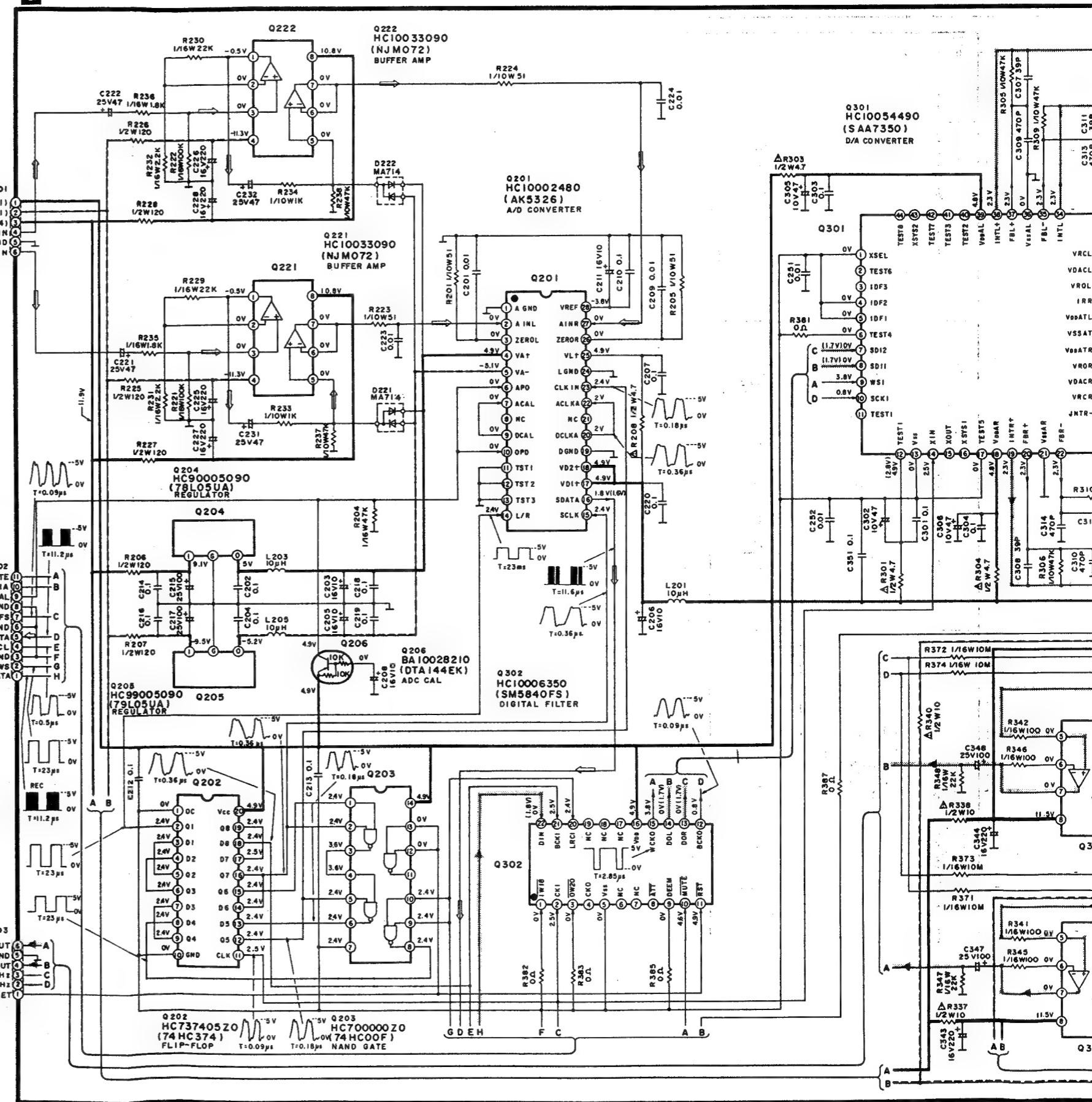
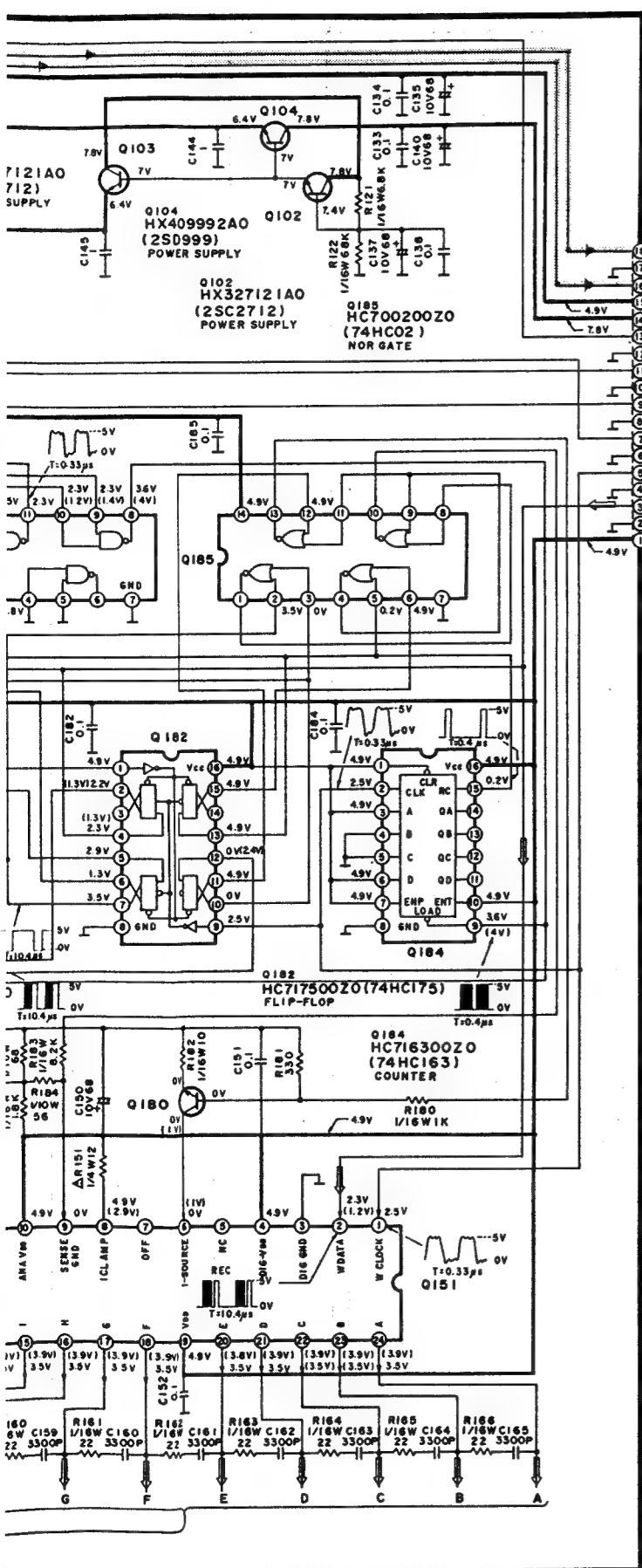
D | SWITCH CIRCUIT



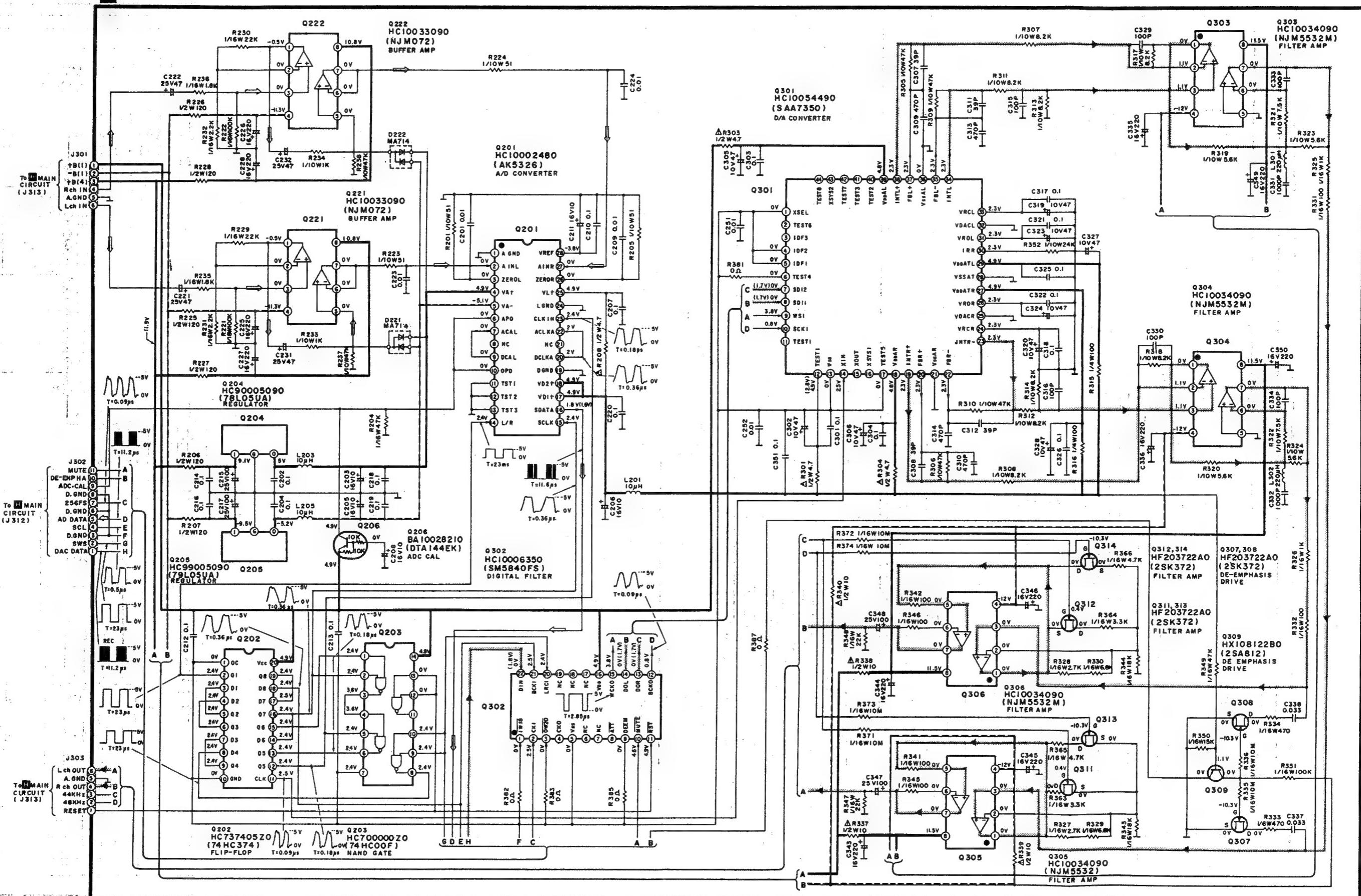
E READ / WRITE CIRCUIT



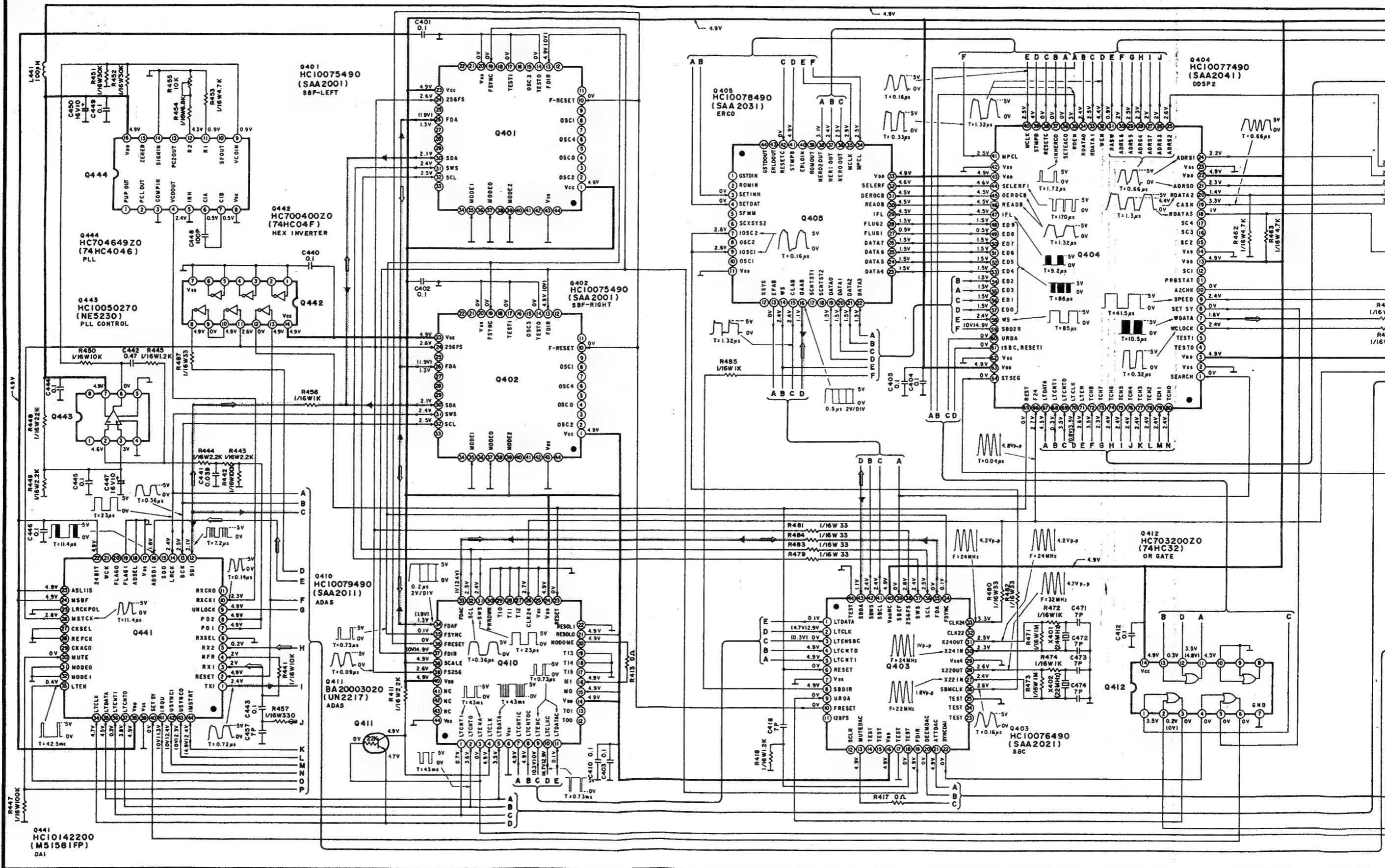
G AD/DA CONVERTER CIRCUIT

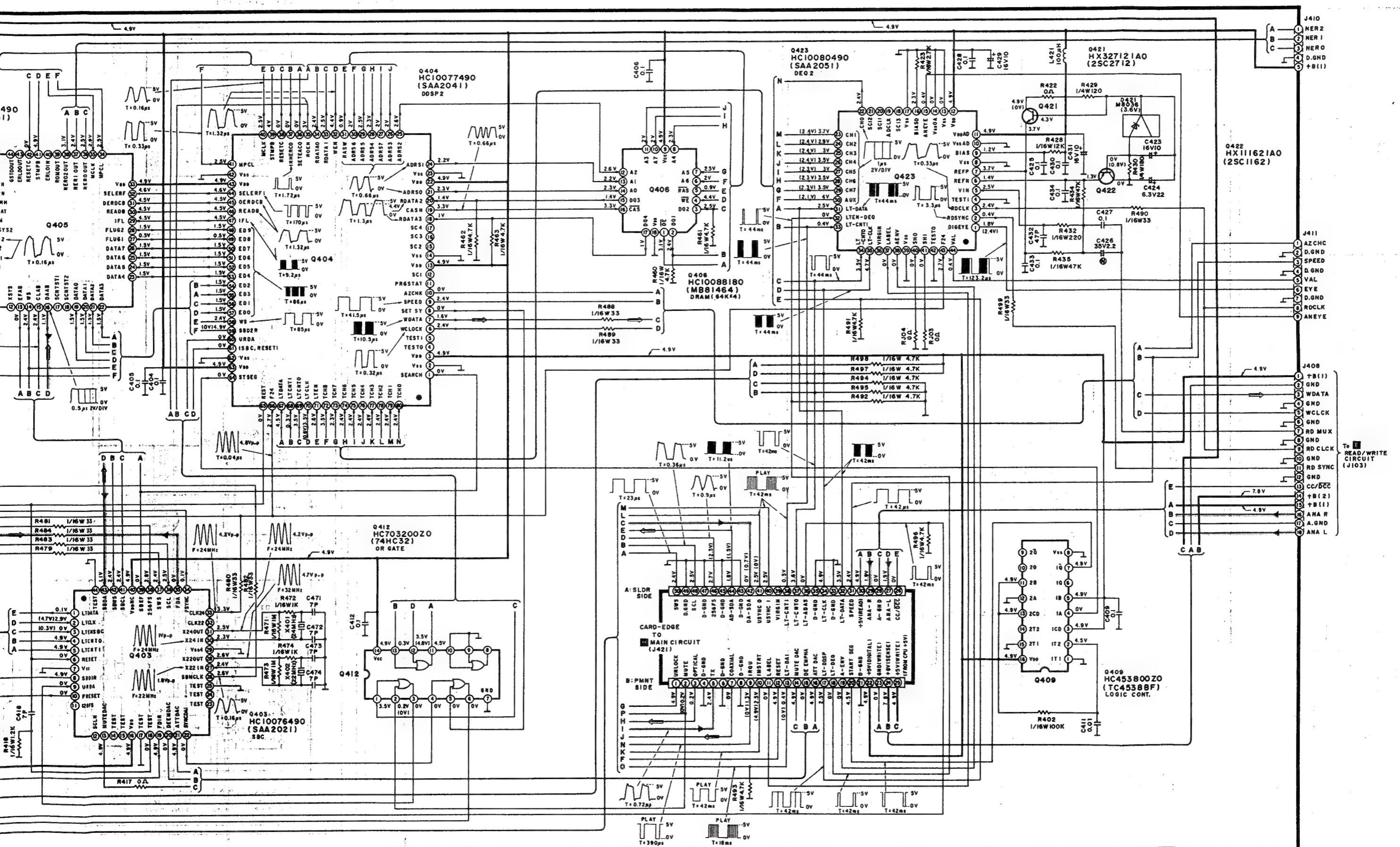


G AD/DA CONVERTER CIRCUIT

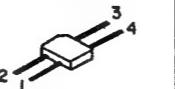
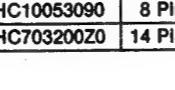
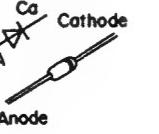
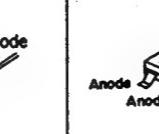
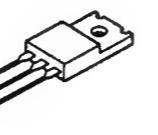


F PASC DIGITAL CIRCUIT



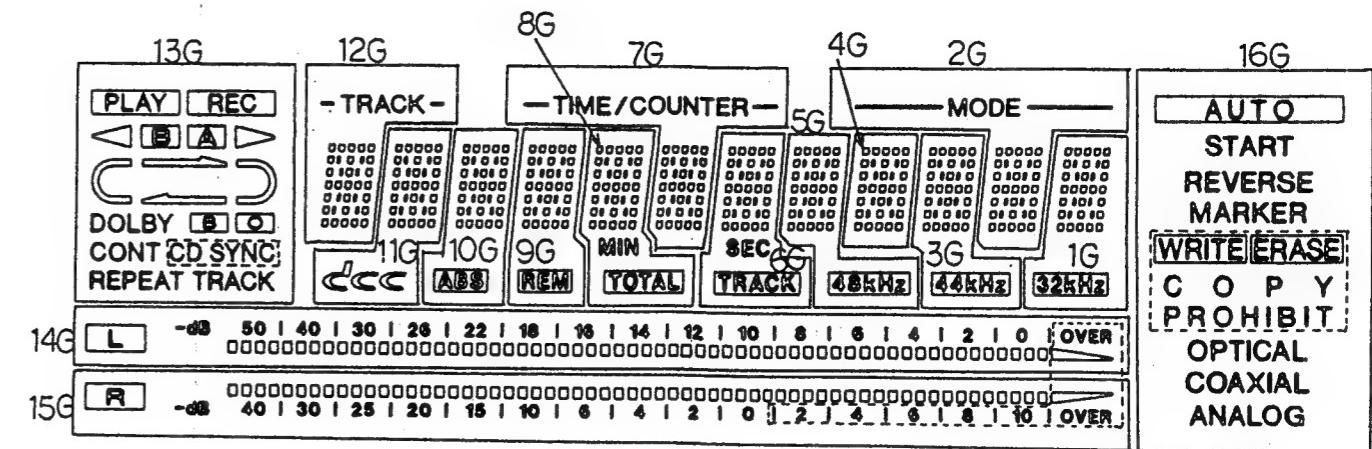


■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

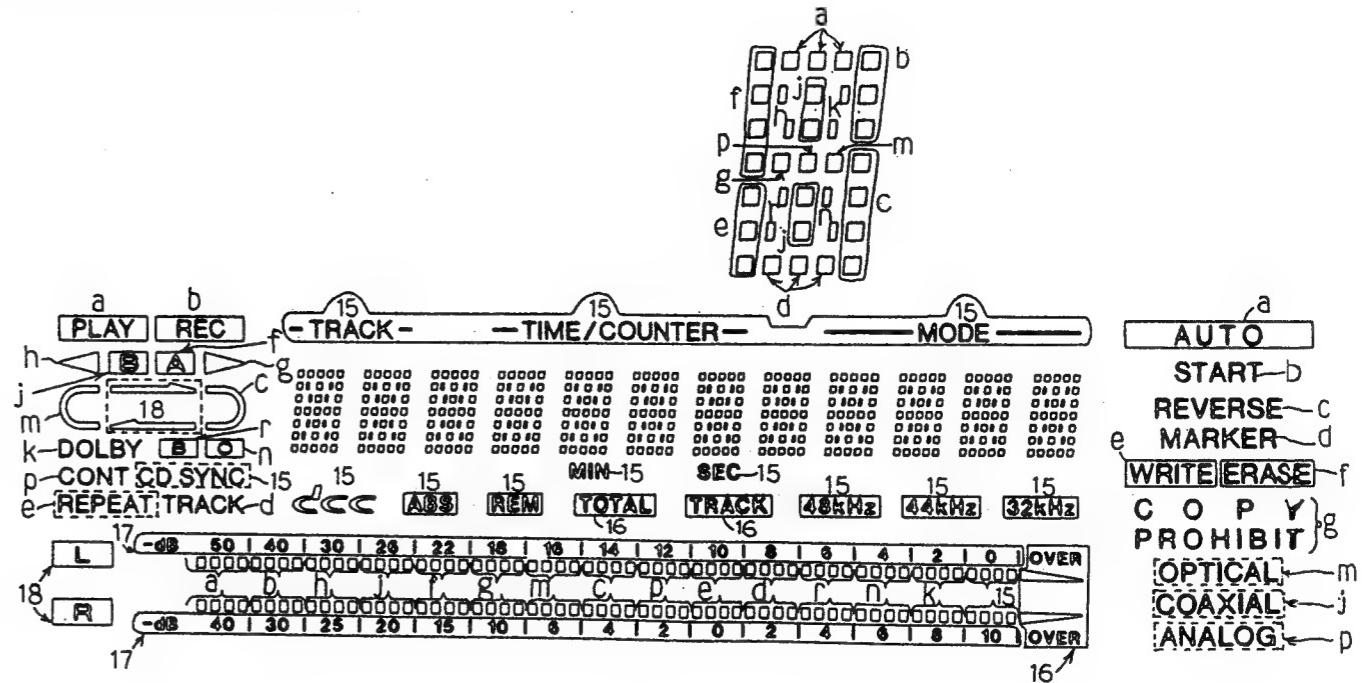
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HC10033090	8 Pin	HC717500Z0	16 Pin																													
HC10034090	8 Pin	HC716300Z0	16 Pin																													
HC10050270	14 Pin	HC10006350	22 Pin																													
HC700200Z0	14 Pin	HC10082490	24 Pin																													
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HC700400Z0	14 Pin																															
HC453800Z0	16 Pin																															
HC737405Z0	20 Pin																															
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HC10054490	44 Pin	HC10080490	44 Pin																													
HC10075490	44 Pin	HC10081490	44 Pin																													
HC10076490	44 Pin	HC10142200	44 Pin																													
HC10078490	44 Pin	HU10112060	94 Pin																													
HC10079490	44 Pin																															
	<table border="1"> <tr><td>HC10153210</td><td>8 Pin</td><td>HC706600B0</td><td>14 Pin</td></tr> <tr><td>HC10235030</td><td>8 Pin</td><td>HC712500B0</td><td>14 Pin</td></tr> <tr><td>HC10340050</td><td>8 Pin</td><td>HC704649Z0</td><td>16 Pin</td></tr> <tr><td>HC10010090</td><td>14 Pin</td><td>HC10002480</td><td>28 Pin</td></tr> <tr><td>HU10111060</td><td>14 Pin</td><td>HC10023250</td><td>30 Pin</td></tr> </table>	HC10153210	8 Pin	HC706600B0	14 Pin	HC10235030	8 Pin	HC712500B0	14 Pin	HC10340050	8 Pin	HC704649Z0	16 Pin	HC10010090	14 Pin	HC10002480	28 Pin	HU10111060	14 Pin	HC10023250	30 Pin											
HC10153210	8 Pin	HC706600B0	14 Pin																													
HC10235030	8 Pin	HC712500B0	14 Pin																													
HC10340050	8 Pin	HC704649Z0	16 Pin																													
HC10010090	14 Pin	HC10002480	28 Pin																													
HU10111060	14 Pin	HC10023250	30 Pin																													
HC10044210 HC10050210	HC10093210 HC10279030	HW10012320	HF203722A0	HT10001000 HT214252B0 HT30001000 HT320602B0 HT421592B0																												
HT421442A0	HT42010000	BA10003210 BA10007210 BA10010210 BA10028210 BA20003020 BA20010210	BA20012210 BA20016210 BA20017210 BA20028210																													
HX108122B0 HX111621A0 HX327121A0 HX409992A0		HD20002000 HD20029050 HD30821000 HD70200490 SVD1SR35200 RVD1SS133TA	MA4039M MA4051M 	HZ20006020 																												
HZ30018050	HI10062320 HI10114320	HC36905320 HC36912320 HC38905320	HC3850809F HC3991209F																													

■ INTERNAL CONNECTION OF FL

• Grid connection diagram



• Anode connection diagram



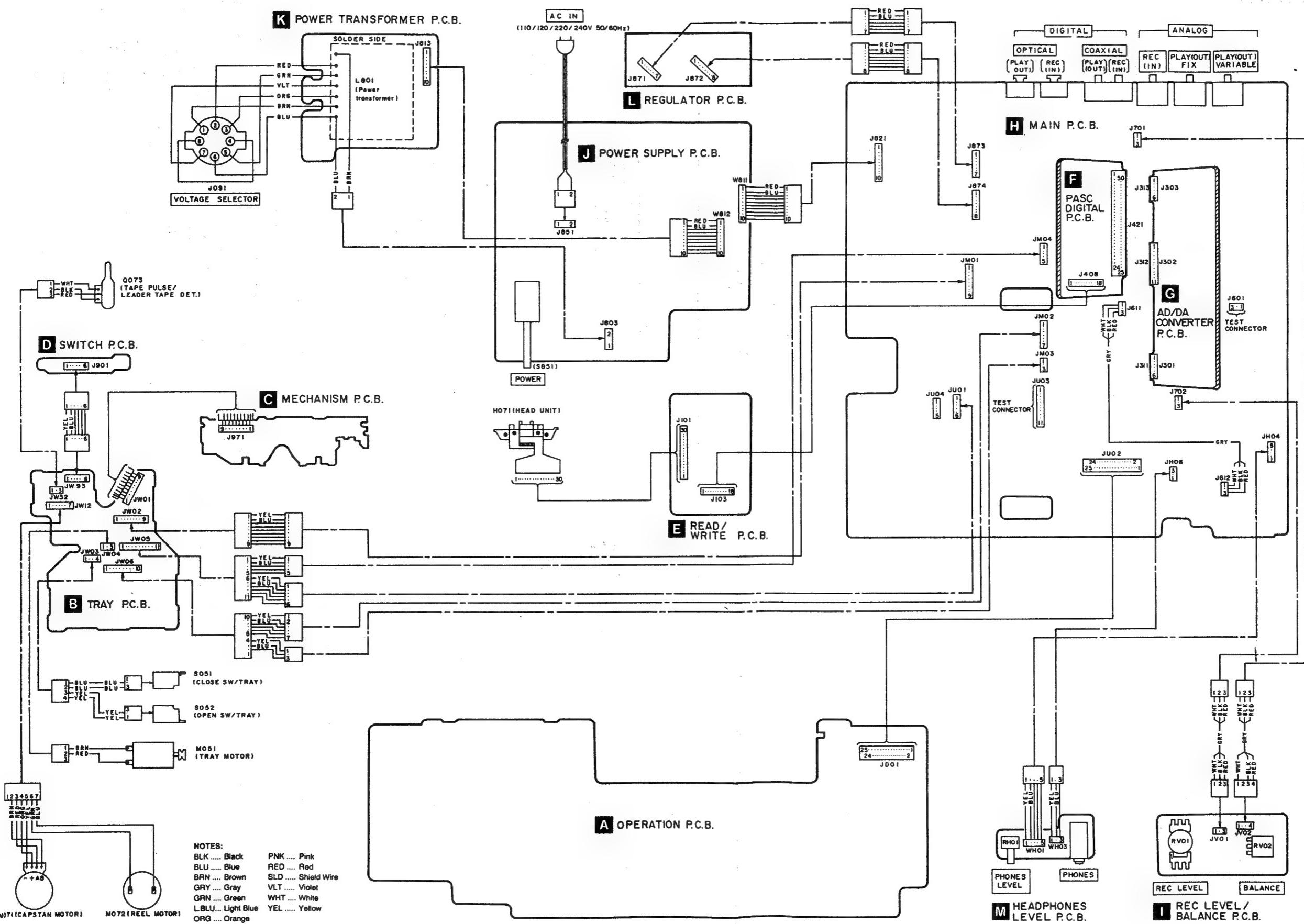
• Pin connection

PIN NO.	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
CONNECTION	N	P	P	P	P	P	P	P	P	P	N	P	P	P	P	P	P	P	P	P	P	16	N	12	11	10	9	8	7	6	5	4	3	2	1	14	15	13	N	F	F
PIN NO.	54	53	52	51	50	49	48	47	46	45	44	43	42	41																											
CONNECTION	F	F	F	N	N	N	N	N	N	N	N	N	N	N	P	P	P	P	P	P	P	a	b																		
2	2	2	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P																				

Notes:

- 1) F1, F2.....Filament
- 2) NP.....No pin
- 3) 1G~16G.....Grid
- 4) Pa~Ph, Pj, Pk, Pm, Pn, Pp, Pr, P15~P18.....Anode

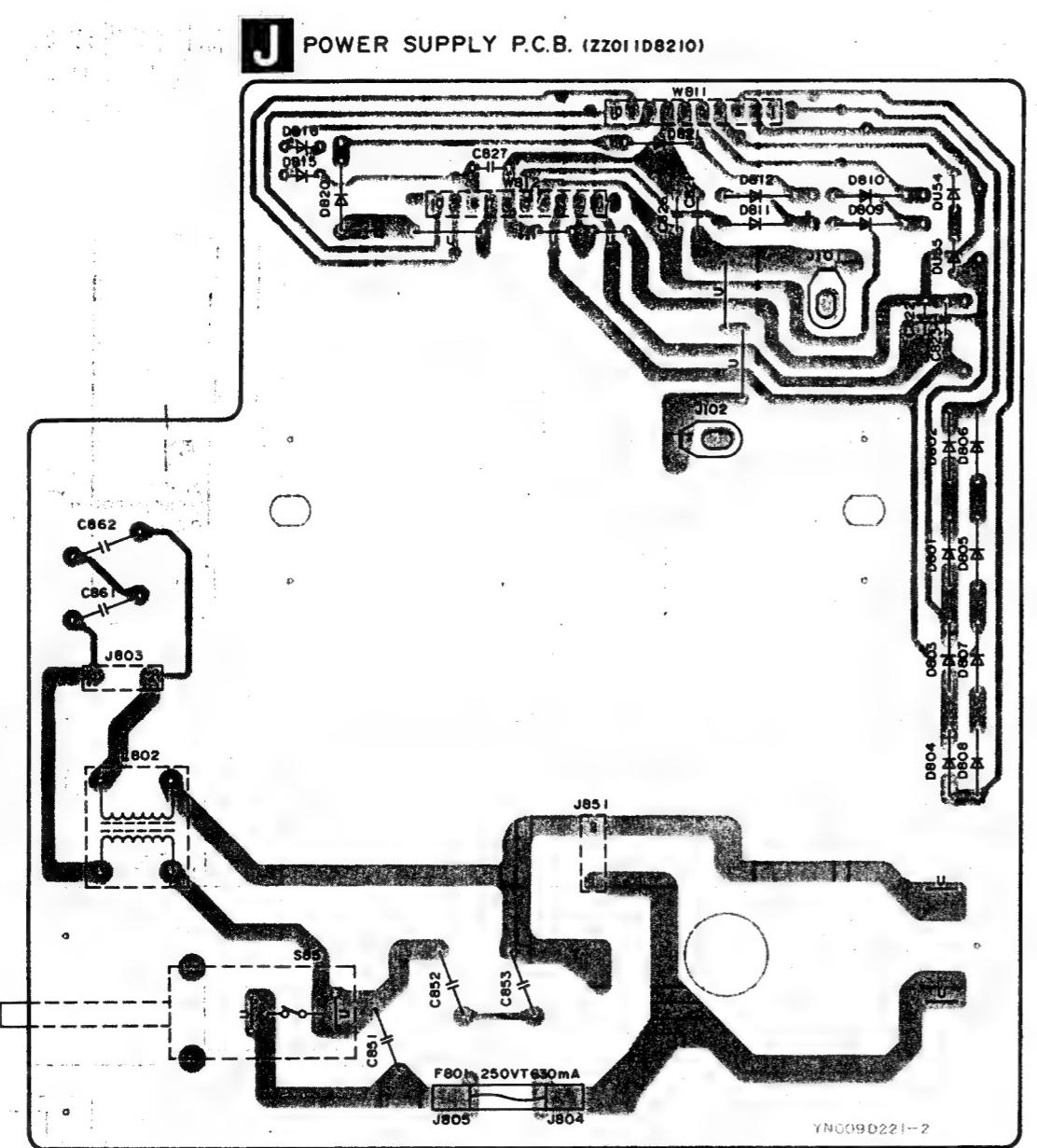
■ WIRING CONNECTION DIAGRAM



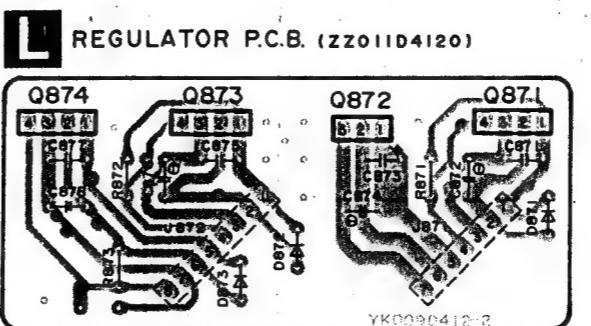
1 2 3 4 5 6 7 8 9 10

PRINTED CIRCUIT BOARDS

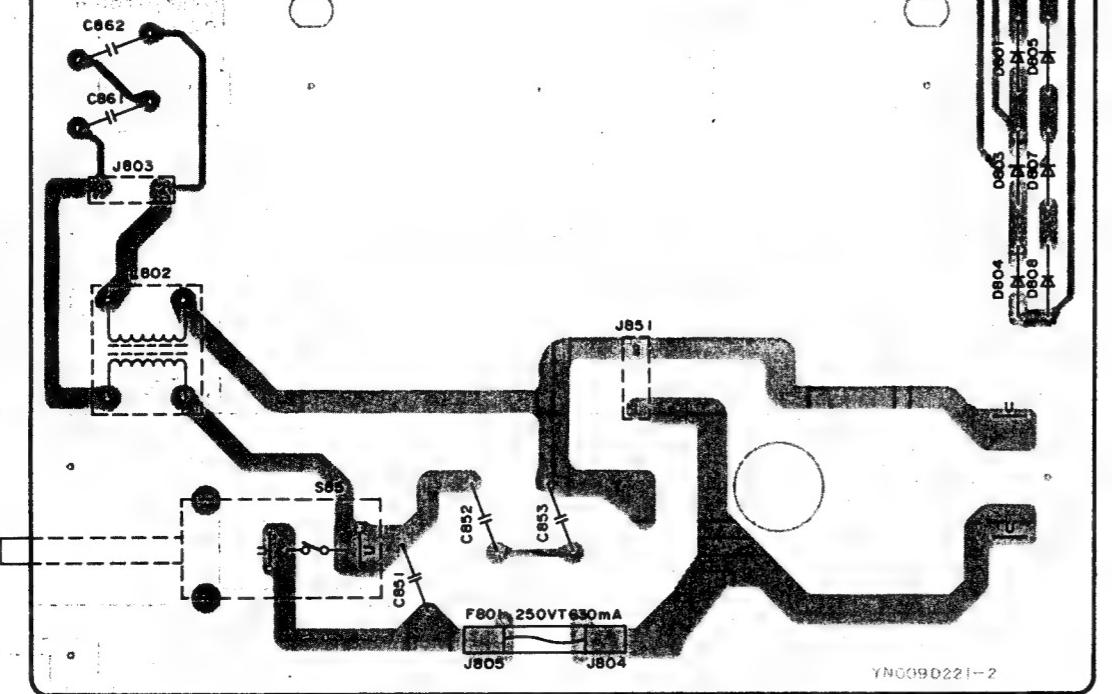
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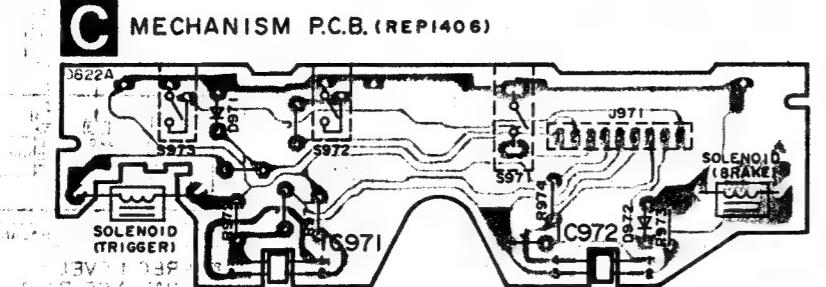
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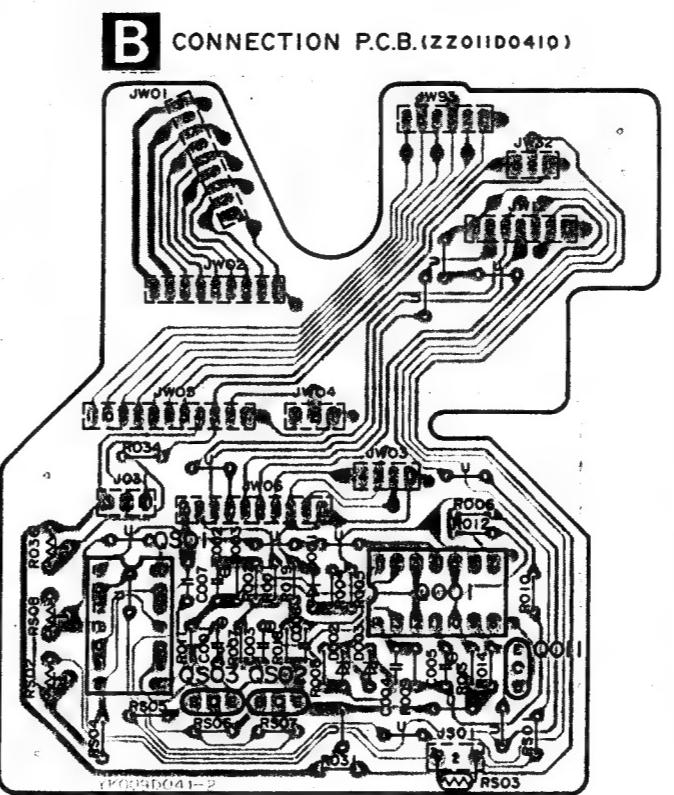
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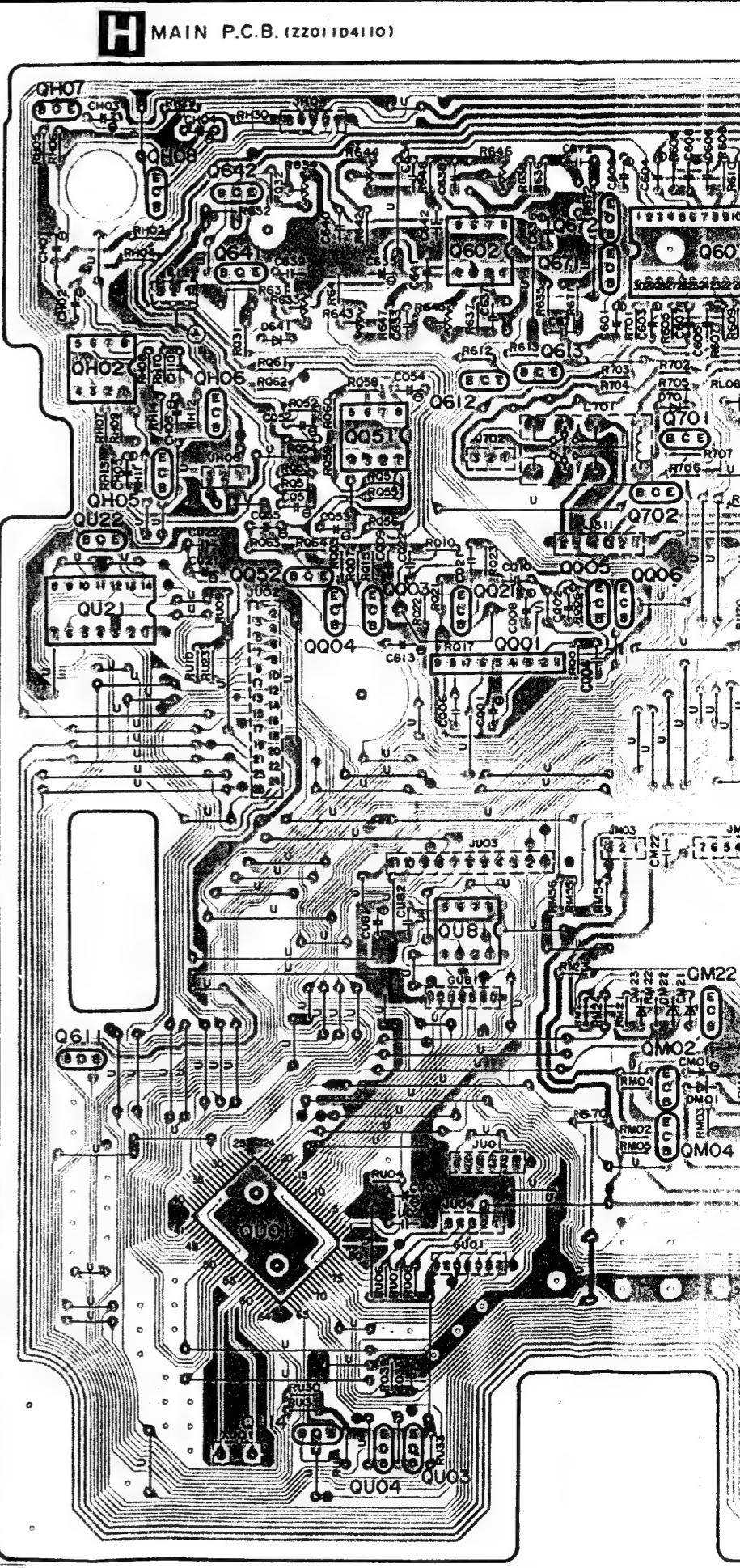
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E

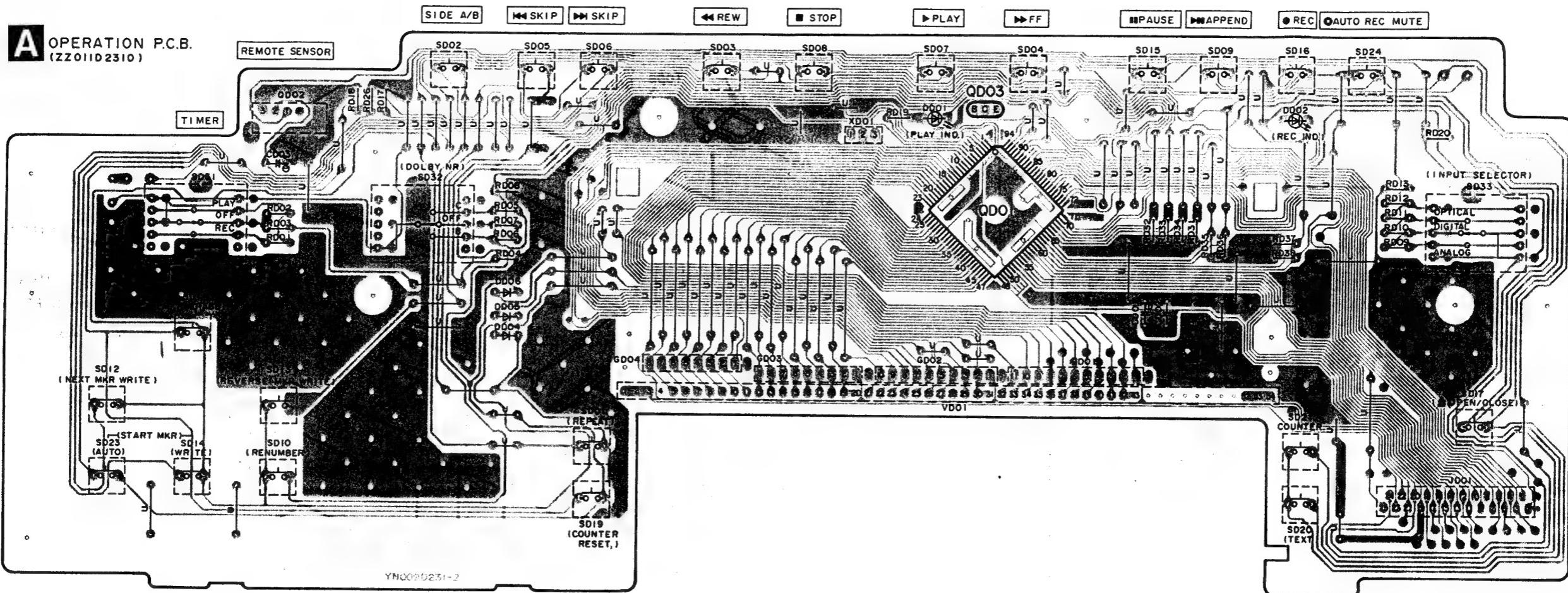


F

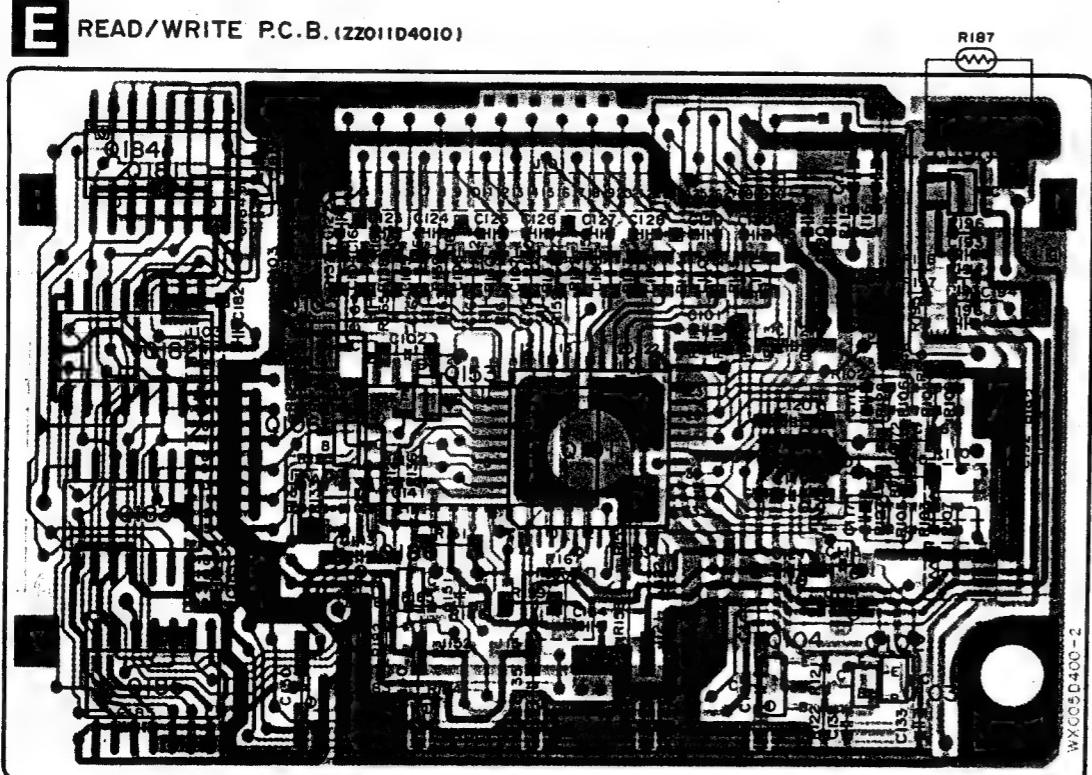


G

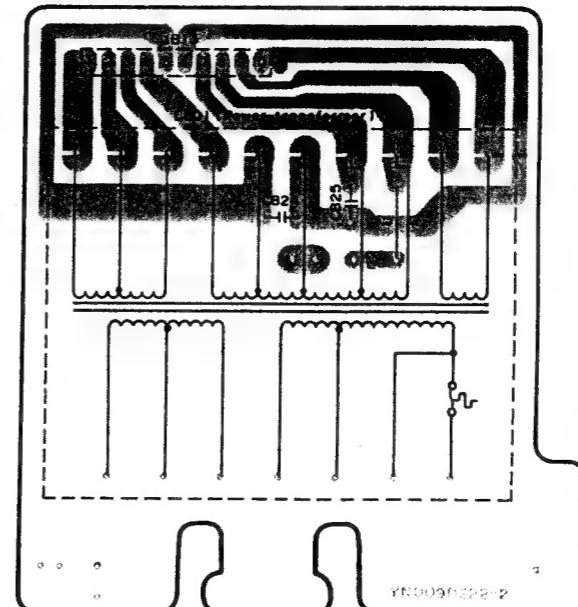
15 16 17 18 19 20 21 22 23 24



F PASCO



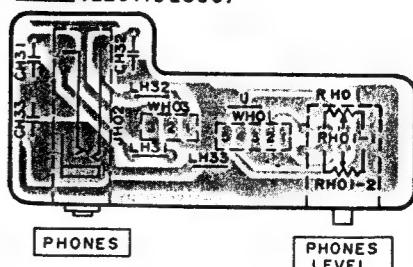
K POWER TRANSFORMER P.C.B.
(ZZ0IID8210)



D SWITCH P.C.B. (REPI405)



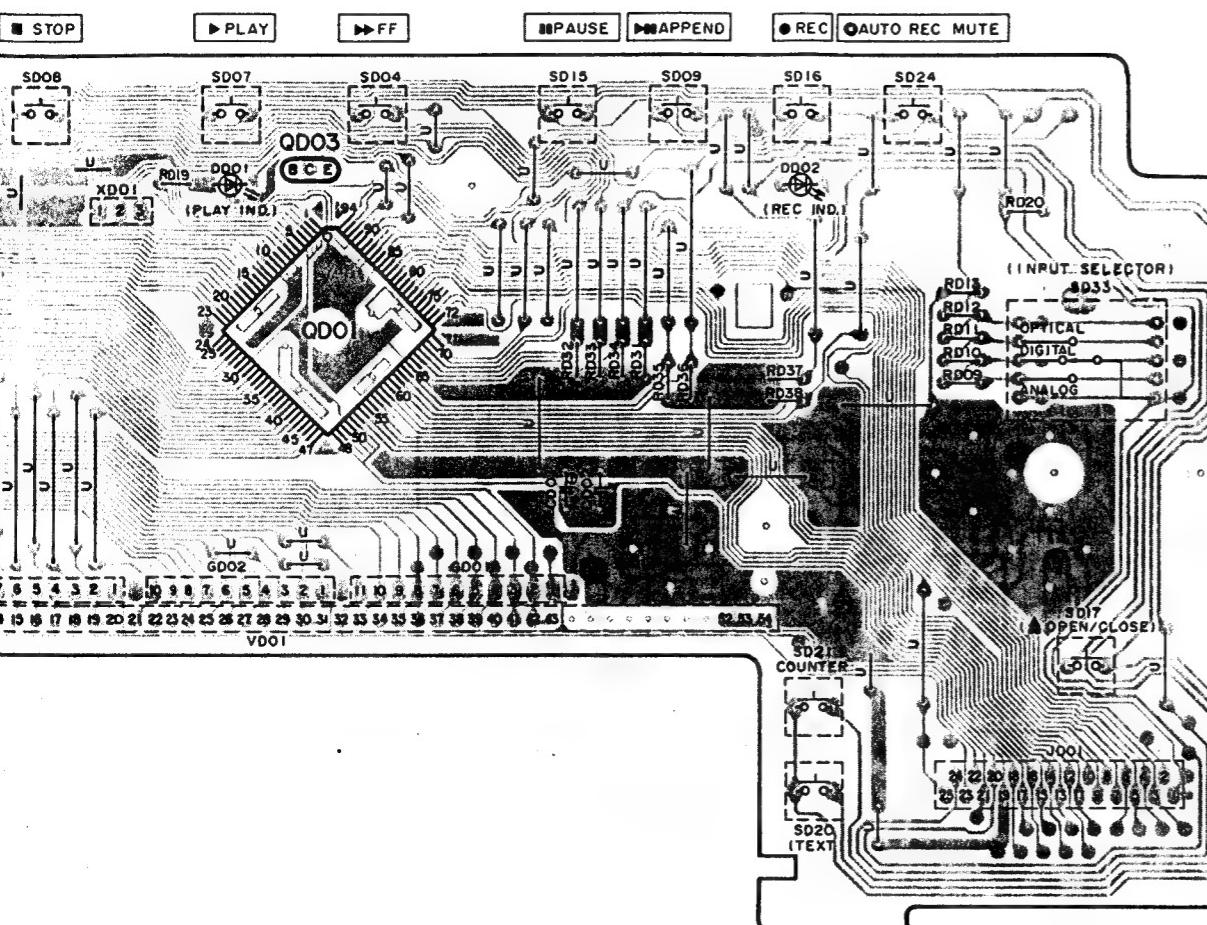
M HEADPHONES LEVEL P.C.B.
(ZZ0IID2330)



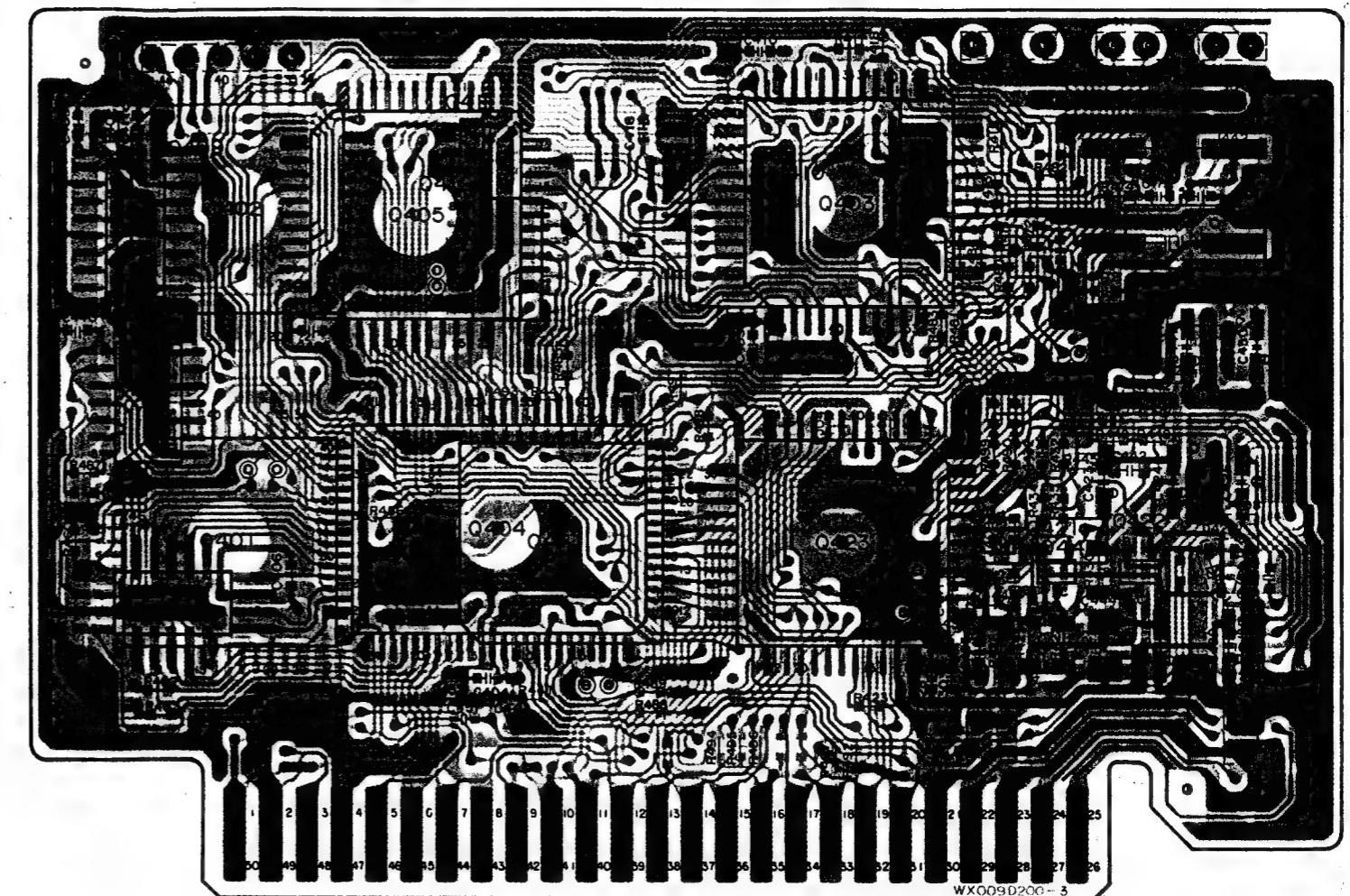
Notes:

- Only this P.C.B. (E) has a three-layered configuration.
- Mark in foil pattern drawing indicates that the lead is connected to the ground pattern on the 2nd layer.

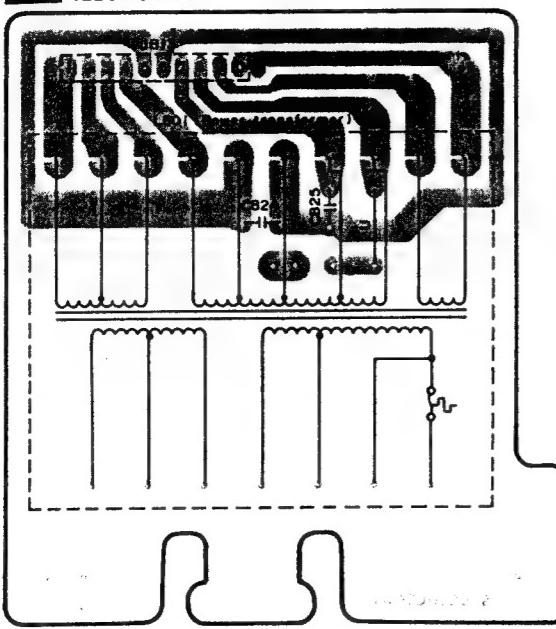
20 21 22 23 24 25 26 27 28 29



F PASC DIGITAL P.C.B. (ZZ01ID9010)



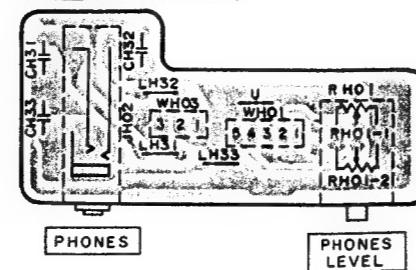
K POWER TRANSFORMER P.C.B.
(ZZ01ID8210)



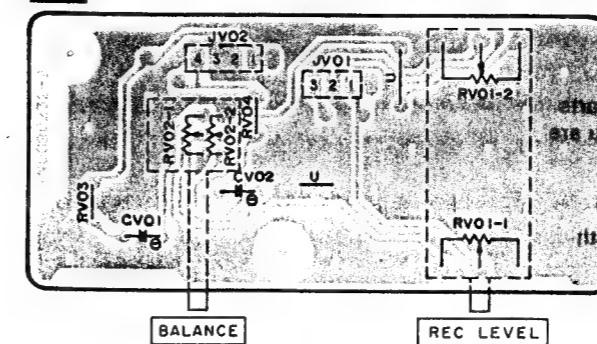
D SWITCH P.C.B. (REP1405)



M HEADPHONES LEVEL P.C.B.
(ZZ01ID2330)



I REC LEVEL/
BALANCE P.C.B. (ZZ01ID2320)



Notes:

- In these printed circuit board diagrams (E, F), the parts and foil patterns on the board facing toward you are printed in black. The opposite side is printed in blue.
- The "•" mark denotes the connection points of double-faced foil patterns (through holes) on both sides of the printed circuit board.
- These printed circuit board diagrams may be modified at any time with the development of new technology.

1 2 3 4 5 6 7 8 9

A

B

C

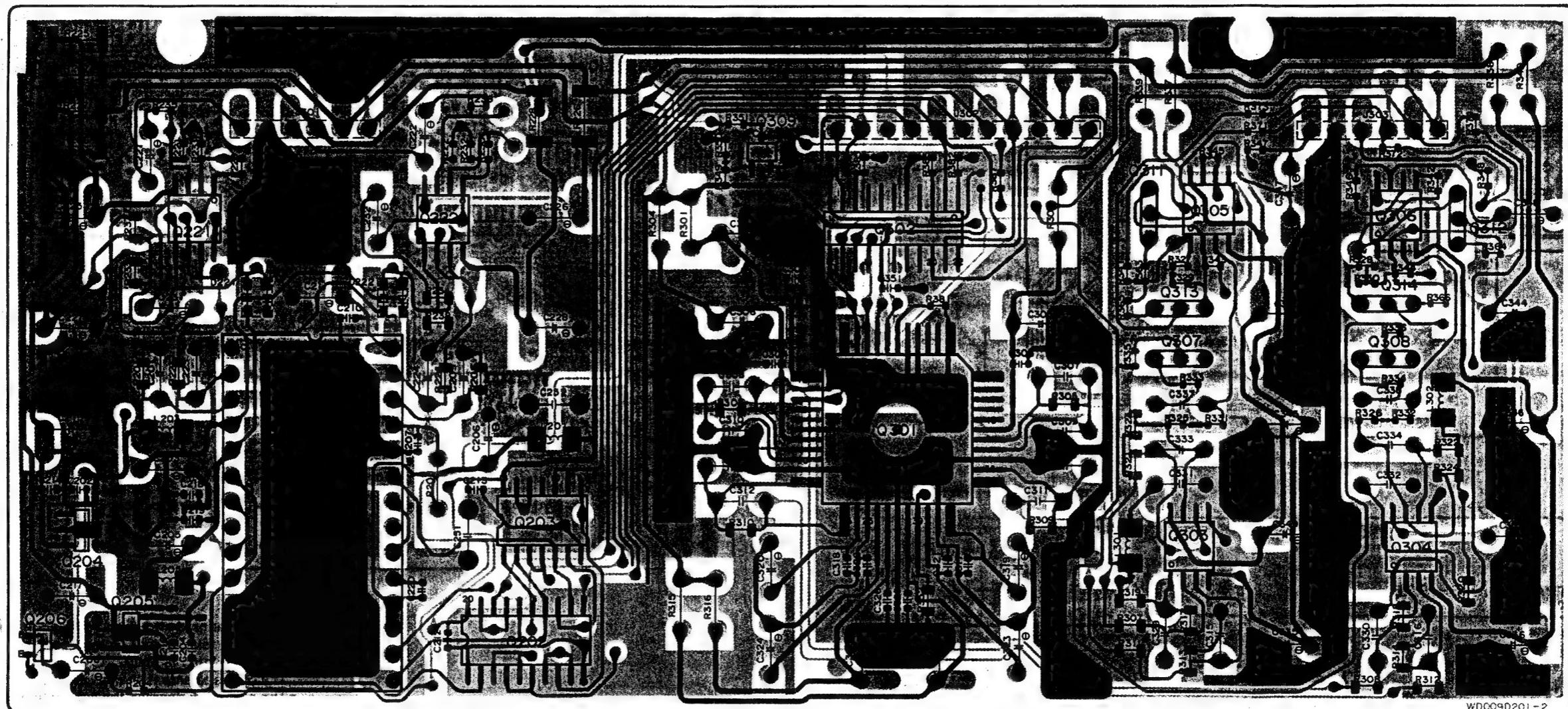
D

E

F

G

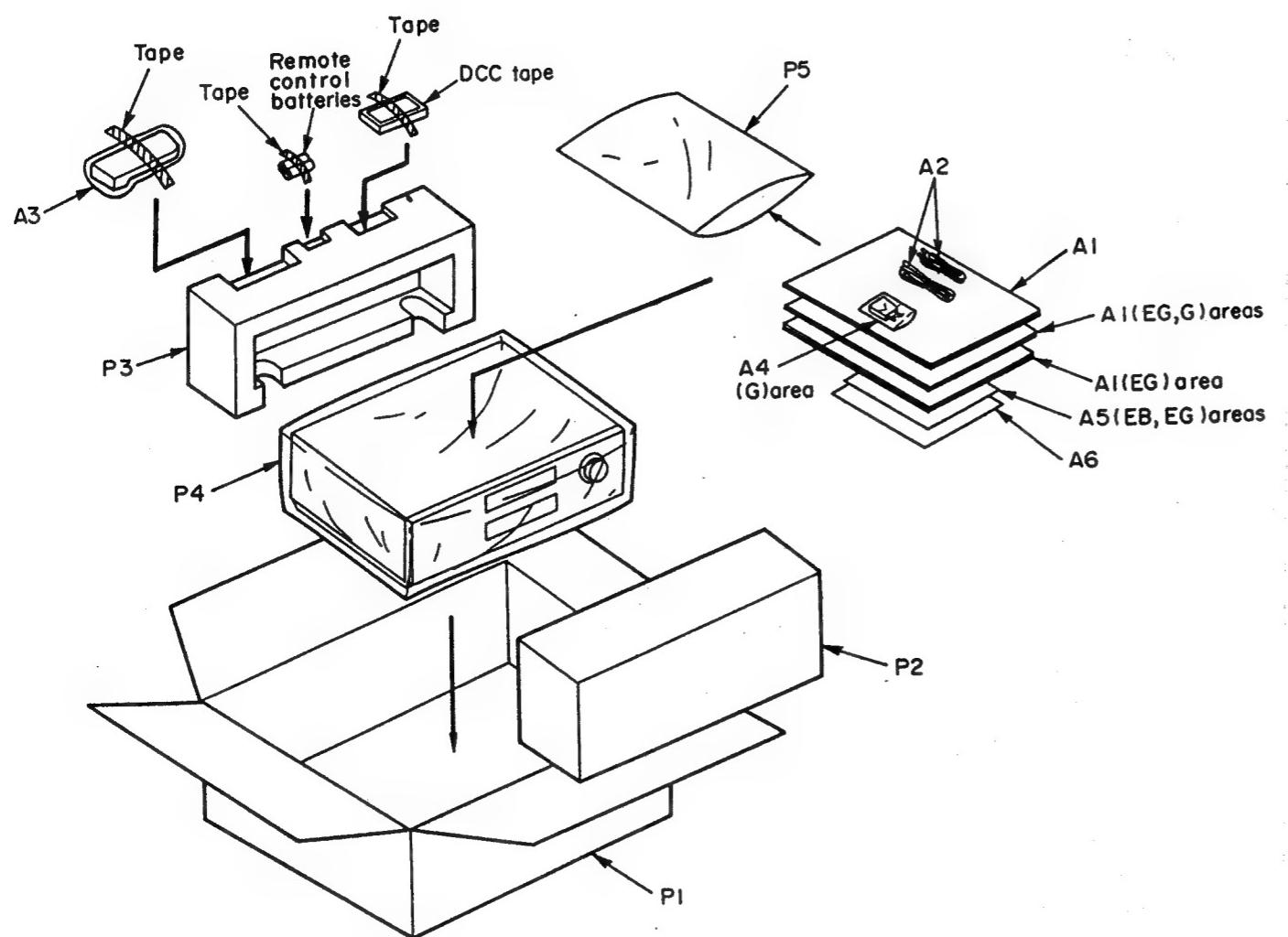
G AD/DA CONVERTER P.C.B. (Z2011D2010)



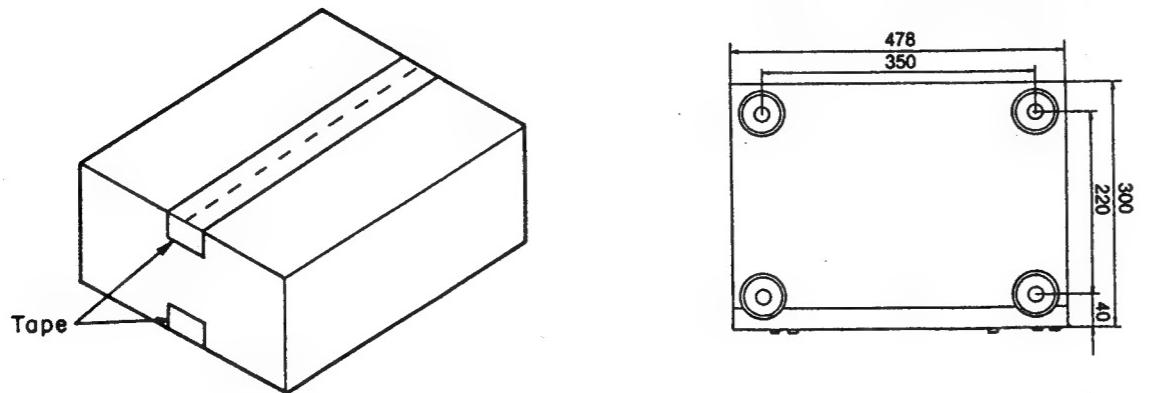
Notes:

- In this printed circuit board diagram (G), the parts and foil patterns on the board facing toward you are printed in black. The opposite side is printed in blue.
- The “*” mark denotes the connection points of double-faced foil patterns (through holes) on both sides of the printed circuit board.
- This printed circuit board diagram may be modified at any time with the development of new technology.

■ PACKAGING



• Position of foot (Dimension: mm)



■ REPLACEMENT PARTS LIST

Notes: *Important safety notice:

Components identified by Δ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

*Remote Control Ass'y:

Supply period for three years from termination of production.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
				Q873	HC36905320	REGULATOR	Δ
		INTEGRATED CIRCUIT(S)		Q874	HC38905320	REGULATOR	Δ
				QA01	HC700400U0	HEX UNBUFFERED INVERTER	
IC971, 972	GP2S06BC	PHOTO COUPLER		QD01	HJ10112060	PANEL CONTROL AND FL DRIVE	
Q001	HC10010090	MOTOR CONTROL		QD02	HW10012320	IR SENSOR	
Q031	HC10340050	QUICK SENSOR DRIVE		QH02	HC10089210	HEADPHONES AMP	
Q101	HC10081490	READ AMP		QL01	HC10050210	LEVEL METER CONTROL	
Q151	HC10082490	WRITE AMP		QL02	HC10089210	BUFFER AMP	
Q181	HC70530020	MULTIPLEXER		QM21	HC10093210	REEL MOTOR DRIVE	
Q182	HC71750020	FLIP-FLOP		QM51	HC10279030	TRAY MOTOR DRIVE	
Q183	HC70000020	NAND GATE		QQ01	HC10044210	QMS CONTROL	
Q184	HC71630020	COUNTER		QQ51	HC10089210	-60dB LEVEL DETECTOR	
Q185	HC70020020	NOR GATE		QS01	HC706600B0	QUAD ANALOG SWITCH	
Q201	HC10002480	A/D CONVERTER		QU01	HJ10111060	MICROCOMPUTER	
Q202	HC737405Z0	FLIP-FLOP		QU21	HC71250080	QUAD 3-STATE BUFFER	
Q203	HC70000020	NAND GATE		QU81	HC10153210	EEP ROM	
Q204	HC90005090	REGULATOR				TRANSISTOR(S)	
Q205	HC99005090	REGULATOR		Q011	HT30001000	TRANSISTOR	
Q221, 222	HC10033090	BUFFER AMP		Q102, 103	HK327121A0	TRANSISTOR	
Q301	HC10054490	D/A CONVERTER		Q104	HK40992A0	TRANSISTOR	
Q302	HC10006350	DIGITAL FILTER		Q105	HK111621A0	TRANSISTOR	
Q303-306	HC10034090	FILTER AMP		Q106	HK327121A0	TRANSISTOR	
Q401	HC10075490	SBF-LEFT		Q153	BA20003020	TRANSISTOR	
Q402	HC10075490	SBF-RIGHT		Q180	HK327121A0	TRANSISTOR	
Q403	HC10076490	SBC		Q190	HK327121A0	TRANSISTOR	
Q404	HC10077490	DDSP2		Q206	BA10028210	TRANSISTOR	
Q405	HC10078490	ERCO		Q307, 308	HF203722A0	F. E. T.	
Q406	HC10088180	DRAM (64kx4)		Q309	HK108122B0	TRANSISTOR	
Q409	HC45380020	LOGIC CONTROL		Q311-314	HF203722A0	F. E. T.	
Q410	HC10079490	ADAS		Q411	BA20003020	TRANSISTOR	
Q412	HC70320020	OR GATE		Q421	HK327121A0	TRANSISTOR	
Q423	HC10080490	DEQ2		Q422	HK111621A0	TRANSISTOR	
Q441	HC10142200	DAIAL FILTER		Q611	BA10003210	TRANSISTOR	
Q442	HC70040020	HEX INVERTER		Q612	BA20010210	TRANSISTOR	
Q443	HC10050270	PLL CONTROL		Q613	BA10007210	TRANSISTOR	
Q444	HC704649Z0	PLL		Q641, 642	BA20028210	TRANSISTOR	
Q601	HC10023250	DOLBY NR B/C		Q671, 672	BA20010210	TRANSISTOR	
Q602	HC10053090	EQUALIZER AMP		Q701	HT421592B0	TRANSISTOR	
Q720	HC10089210	OUTPUT AMP		Q702	BA20017210	TRANSISTOR	
Q731	HC10235030	MOTOR DRIVE		Q761-768	HT421442A0	TRANSISTOR	
Q751	HC10053090	BUFFER AMP		Q806	HT421592B0	TRANSISTOR	
Q811	HC36905320	REGULATOR	Δ	Q807	HT214252B0	TRANSISTOR	
Q812	HC3850809F	REGULATOR	Δ	Q809, 810	BA20017210	TRANSISTOR	
Q872	HC3991209F	REGULATOR	Δ				

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
Q843	BA20017210	TRANSISTOR		D801-812	SVD1SR35200	DIODE	△
QA02	BA20010210	TRANSISTOR		D815, 816	SVD1SR35200	DIODE	△
QA03	HT10001000	TRANSISTOR		D817	MA4051M	ZENER	
QA04	HT30001000	TRANSISTOR		D818, 819	HD30821000	ZENER	
QD03	BA10007210	TRANSISTOR		D820, 821	SVD1SR35200	DIODE	△
QH05, 06	BA20028210	TRANSISTOR		D822	SVD1SR35200	DIODE	△
QH07, 08	BA20028210	TRANSISTOR		D823, 824	HD20002000	DIODE	
QM01	BA20017210	TRANSISTOR		D828	SVD1SR35200	DIODE	△
QM02	BA10003210	TRANSISTOR		D841	SVD1SR35200	DIODE	△
QM03	HT42010000	TRANSISTOR		D871-873	SVD1SR35200	DIODE	△
QM04	BA20017210	TRANSISTOR		D971, 972	RVD1SS133TA	DIODE	
QM22	BA20017210	TRANSISTOR		DD01	HI10114320	L. E. D. (GREEN)	
QM81-84	BA20017210	TRANSISTOR		DD02	HI10062320	L. E. D. (ORANGE)	
QM85, 86	HT320602B0	TRANSISTOR		DD04-06	HD20002000	DIODE	
QM87	HT214252B0	TRANSISTOR		DH01-04	HD20002000	DIODE	
QQ03-06	BA20017210	TRANSISTOR		DM01	HD20002000	DIODE	
QQ21	HT30001000	TRANSISTOR		DM21	MA4039M	ZENER	
QQ52	BA20017210	TRANSISTOR		DM22	HD30821000	ZENER	
QR51, 52	BA20012210	TRANSISTOR		DM23	HD20002000	DIODE	
QS02	BA20016210	TRANSISTOR		DM51	HD30821000	ZENER	
QS03	BA20012210	TRANSISTOR		DM52	HD20002000	DIODE	
QU02	BA20017210	TRANSISTOR		DJ11	MA4039M	ZENER	
QU03-05	BA10007210	TRANSISTOR		DJ51	HD20002000	DIODE	
QU11	BA10007210	TRANSISTOR		DJ53	HD20002000	DIODE	
QU12	BA10003210	TRANSISTOR		DJ54, 55	SVD1SR35200	DIODE	△
QU13, 14	BA20017210	TRANSISTOR		DJ56	HD20002000	DIODE	
QU16	BA10003210	TRANSISTOR		DJ61	HD20002000	DIODE	
QU17	BA20017210	TRANSISTOR		DJ62	HD20029050	DIODE	
QU18	BA10007210	TRANSISTOR				VARIABLE RESISTOR(S)	
QU19	HT30001000	TRANSISTOR					
QU22	BA20010210	TRANSISTOR					
QU33	BA10010210	TRANSISTOR		R036	RA02230760	QUICK SENSOR ADJ.	
QU41	HT30001000	TRANSISTOR		R101, 102	NY04720090	ANALOG OUTPUT LEVEL ADJ.	
QU52	BA10007210	TRANSISTOR		R109, 110	NY04720090	ANALOG OUTPUT DIST. ADJ.	
QU53	BA20010210	TRANSISTOR		R135	NY01020090	DCC P. B. LEVEL ADJ.	
QU54	BA10010210	TRANSISTOR		R167	NY01010160	DCC OPT. REC. BIAS Curr. ADJ.	
QU55-57	BA20017210	TRANSISTOR		R455	NY01030090	PLL ADJ.	
QU61	BA20010210	TRANSISTOR		R633, 634	RA01030780	DOLBY NR ADJ.	
QU52	BA10007210	TRANSISTOR		R643, 644	RA04730780	ANALOG P. B. RES. ADJ. (HIGH)	
QU63	HT42010000	TRANSISTOR		R645, 646	RA04740780	ANALOG P. B. RES. ADJ. (LO)	
QU64	BA20010210	TRANSISTOR		R731	RY02030040	MOTOR VOLUME	
QU65	BA10007210	TRANSISTOR		RHD1	RM02030430	PHONES LEVEL	
		DIODE(S)		RL05, 06	RA02220780	LEVEL METER ADJ.	
D001	HD20002000	DIODE		RS02	RA04720760	TAPE SPEED ADJ. (FORWARD)	
D002, 003	HD70200490	ZENER		RS08	RA04710760	TAPE SPEED ADJ. (REVERSE)	
D032	HD20002000	DIODE		RV01	RM05031830	REC LEVEL	
D221, 222	HZ20006020	DIODE		RV02	RM01041490	BALANCE	
D421	HZ30018050	DIODE				THERMISTOR(S)	
D701	SVD1SR35200	DIODE		R187	HH00030020	THERMISTOR	
D702, 703	HD20002000	DIODE		RS03	HH00031020	THERMISTOR	

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		COIL (S)		S902	RSP1B001-A	TAPE DETECTION	(S902-1, 902-2)
L101, 102	LU01153010	COIL		S971	RSH1A89ZC-U	MODE	
L201	LU12103010	COIL		S972	RSH1A90YC-U	CASSETTE HALF DETECTION	
L203	LU12103010	COIL		S973	RSH1A90YC-U	ATS	
L205	LU12103010	COIL		SD01	SP0101128X	REPEAT	
L301, 302	LU02224010	COIL		SD02	SP0101128X	SIDE A/B	
L421	LU12104010	COIL		SD03	SP0101128X	REW	
L441	LU12104010	COIL		SD04	SP0101128X	FF	
L451	FM12223010	COIL		SD05	SP0101128X	SKIP(VERSE)	
L711-718	FC90050090	COIL		SD06	SP0101128X	SKIP(FORWARD)	
LA01	TP41042010	COIL		SD07	SP0101128X	PLAY	
LA02	LC11030140	CHOKE COIL		SD08	SP0101128X	STOP	
LA03	LC14730140	CHOKE COIL		SD09	SP0101128X	APPEND	
LH31-33	FC90050090	COIL		SD10	SP0101128X	RENUMBER	
		TRANSFORMER(S)		SD11	SP0101128X	MRK ERASE	
L801	TS16670030	POWER TRANSFORMER	(G) △	SD12	SP0101128X	NEXT MRK WRITE	
L801	TS16670010	POWER TRANSFORMER	(EB, EG) △	SD13	SP0101128X	REVERSE MRK WRITE	
L802	FN01010020	TRANSFORMER	△	SD14	SP0101128X	START MRK WRITE	
		COMPONENT COMBINATION(S)		SD15	SP0101128X	PAUSE	
GD01	BW05473120	COMBINATION PART(47KX10)		SD16	SP0101128X	REC	
GD02	BW05473110	COMBINATION PART(47KX9)		SD17	SP0101128X	TRAY OPEN/CLOSE	
GD03	BW05473100	COMBINATION PART(47KX8)		SD19	SP0101128X	COUNTER RESET	
GD04	BW05473090	COMBINATION PART(47KX7)		SD20	SP0101128X	TEXT	
GU01	BW05103150	COMBINATION PART(10KX6)		SD21	SP0101128X	COUNTER	
GU81	BW05103150	COMBINATION PART(10KX6)		SD23	SP0101128X	AUTO START MRK	
		OSCILLATOR(S)		SD24	SP0101128X	AUTO REC MUTE	
X401	FZ02455010	CERAMIC FILTER(24MHz)		SD31	SR01030080	TIMER	
X402	FZ02255010	CERAMIC FILTER(22MHz)		SD32	SR01030070	DOLBY NR	
XD01	FQ04194020	CERAMIC FILTER(4.19MHz)		SD33	SR01030070	INPUT SELECTOR	
XU01	FQ04194020	CERAMIC FILTER(4.19MHz)				RELAY(S)	
		DISPLAY TUBE(S)		L701	LY20120320	RELAY	
VD01	HQ31605060	FL DISPLAY TUBE	△			CONNECTOR(S) AND SOCKET(S)	
		FUSE (S)		J031	YP06006930	CONNECTOR(3P)	
F801	FS10063850	FUSE, 250V, T630mA	△	J101	YJ07006250	CONNECTOR(30P)	
		SWITCH(ES)		J103	YJ07006090	CONNECTOR(18P)	
J091	BY05080070	VOLTAGE SELECTOR	(G) △	J301	YP06006290	CONNECTOR(6P)	
S851	SP01011830	POWER	△	J302	YP06006470	CONNECTOR(11P)	
S901	RSP1C001-A	TAPE P. TIME DETECTION	(S901-1-901-3)	J303	YP06006290	CONNECTOR(6P)	
				J311	YJ06008760	SOCKET(6P)	
				J312	YJ06008810	SOCKET(11P)	
				J313	YJ06008760	SOCKET(6P)	
				J408	YJ07006100	CONNECTOR(18P)	
				J421	YJ07006130	CONNECTOR(50P)	
				J601	YP06006930	CONNECTOR(6P)	
				J701, 702	YP06003830	CONNECTOR(3P)	
				J803	YP04000760	CONNECTOR(2P)	
				J813	YP06011900	CONNECTOR(10P)	
				J821	YP06012300	CONNECTOR(10P)	

Ref. No.	Part No.	Part Name & Description	Remarks
J851	YP04000760	CONNECTOR (2P)	
J871	YP06010460	CONNECTOR (7P)	
J872	YP06003880	CONNECTOR (8P)	
J873	YP06010460	CONNECTOR (7P)	
J874	YP06003880	CONNECTOR (8P)	
JD01	YJ07006080	CONNECTOR (25P)	
JH04	YP06006650	CONNECTOR (5P)	
JH06	YP06003830	CONNECTOR (3P)	
JM01	YP06006690	CONNECTOR (9P)	
JM02	YP06006670	CONNECTOR (7P)	
JM03	YP06003830	CONNECTOR (3P)	
JM04	YP06006650	CONNECTOR (5P)	
JU01	YP06006660	CONNECTOR (6P)	
JU02	YJ07006070	CONNECTOR (25P)	
JU04	YP06006650	CONNECTOR (5P)	
JV01	YP06003830	CONNECTOR (3P)	
JV02	YP06003910	CONNECTOR (4P)	
JW01	YJ06011690	CONNECTOR (9P)	
JW02	YP06006690	CONNECTOR (9P)	
JW03	YP06006640	CONNECTOR (4P)	
JW04	YP06003830	CONNECTOR (3P)	
JW05	YP06006710	CONNECTOR (11P)	
JW06	YP06006700	CONNECTOR (10P)	
JW12	YP06006670	CONNECTOR (7P)	
JW32	YJ06006230	CONNECTOR (3P)	
JW93	YJ06006260	CONNECTOR (6P)	
		JACK (S)	
J740	YT02021080	TERMINAL BOARD (2P) : FIX	
J741	YT02021080	TERMINAL BOARD (2P) : VARIABLE	
J742	YT02021080	TERMINAL BOARD (2P) : REC	
JA01	YJ15000080	OPTICAL PLAY	
JA02	YJ15000120	OPTICAL REC	
JA03	YT02021070	TERMINAL BOARD (2P) : COAXIAL	
JH02	YJ01003490	JACK, HEADPHONES	
		FLAT CABLE (S)	
J611 (J612)	YB00170640	CONNECTIVE CORD (3P)	
W010	YW009D0010	WIRE MATERIALS	(G)
W103	YU18200520	FPC BOARD (18P)	
W803	YB00181770	CONNECTIVE CORD (2P)	(EB, EG)
W803	YB00203570	CONNECTIVE CORD (2P)	(G)
W811	YB00050850	CONNECTIVE CORD (10P)	
W812	YB00081430	CONNECTIVE CORD (10P)	
W871	YB00121600	CONNECTIVE CORD (7P)	
W872	YB00121610	CONNECTIVE CORD (8P)	
WD01	YU25150520	FPC BOARD (25P)	
WH01	YB00104160	CONNECTIVE CORD (5P)	
WH03	YB00081510	CONNECTIVE CORD (3P)	
WM01	YU09220270	FLAT CABLE (9P)	

■ RESISTORS AND CAPACITORS

Notes : • Capacity values are in microfarads (μF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
 • Resistance values are in ohms, unless specified otherwise, 1K=1,000 (ΩM) , 1M=1,000k (ΩM)

Ref. No.	Part No.	Values & Remarks		Ref. No.	Part No.	Values & Remarks		Ref. No.	Part No.	Values & Remarks							
RESISTORS																	
R001	ERDS2TJ472	1/4W	4.7K	R184	N105560110	1/10W	56	R371-374	NN05106610	1/16W	10M						
R002	ERDS2TJ683	1/4W	68K	R185	NN05182610	1/16W	1.8K	R402	ERJ2GEYJ104V	1/16W	100K						
R003	ERDS2TJ274	1/4W	270K	R186	NN05680610	1/16W	58	R411	ERJ2GEYJ222V	1/16W	2.2K						
R004	ERDS2TJ102	1/4W	1K	R192	NN05182610	1/16W	1.8K	R423	ERJ2GEYJ272V	1/16W	2.7K						
R005, 006	ERDS2TJ104	1/4W	100K	R193	ERJ2GEYJ152V	1/16W	1.5K	R428	ERJ2GEYJ123V	1/16W	12K						
R007	ERDS2TJ682	1/4W	6.8K	R194	NN05561610	1/16W	560	R429	ERDS2TJ121	1/4W	120						
R008	ERDS2TJ104	1/4W	100K	R195	NN05121610	1/16W	120	R430	ERDS2TJ181	1/4W	180						
R009, 010	ERDS2TJ472	1/4W	4.7K	R196-198	NN05390610	1/16W	39	R432	NN05221610	1/16W	220						
R011	ERDS2TJ103	1/4W	10K	R201	N101510110	1/10W	51	R434, 435	ERJ2GEYJ473V	1/16W	47K						
R012	ERDS2TJ332	1/4W	3.3K	R204	ERJ2GEYJ473V	1/16W	47K	R441	ERJ2GEYJ103V	1/16W	10K						
R013	ERDS2TJ392	1/4W	3.9K	R205	N101510110	1/10W	51	R442	ERJ2GEYJ104V	1/16W	100K						
R014	ERDS2TJ184	1/4W	180K	R206, 207	RI05121120	1/2W	120	R443, 444	ERJ2GEYJ222V	1/16W	2.2K						
R018, 019	ERJ2GEYJ154V	1/4W	10K	R208	ERQ12AJ4R7	1/2W	4.7 △	R445	ERJ2GEYJ122V	1/16W	1.2K						
R031	ERDS2TJ151	1/4W	150 △	R221, 222	ERJ2GEYJ104V	1/16W	100K	R447	ERJ2GEYJ104V	1/16W	100K						
R032	ERDS2TJ103	1/4W	10K	R223, 224	N101510110	1/10W	51	R448, 449	NN05223610	1/16W	22K						
R033	ERDS2TJ102	1/4W	1K	R225-228	RI05121120	1/2W	120	R450	ERJ2GEYJ103V	1/16W	10K						
R034	ERDS2TJ222	1/4W	2.2K	R229, 230	NN05223610	1/16W	22K	R451, 452	NN05303610	1/16W	30K						
R035	ERDS2TJ104	1/4W	100K	R231, 232	ERJ2GEYJ222V	1/16W	2.2K	R453	ERJ2GEYJ472V	1/16W	4.7K						
R039	ERDS2TJ104	1/4W	100K	R233, 234	N101102110	1/10W	1K	R454	ERJ2GEYJ682V	1/16W	6.8K						
R103, 104	ERJ2GEYJ473V	1/16W	47K	R235, 236	NN05182610	1/16W	1.8K	R471	ERJ2GEYJ105V	1/16W	1M						
R105, 106	NN05303610	1/16W	30K	R237, 238	N101473110	1/10W	47K	R472	ERJ2GEYJ102V	1/16W	1K						
R107, 108	ERJ2GEYJ154V	1/16W	150K	R301	ERQ12AJ4R7	1/2W	4.7 △	R473	ERJ2GEYJ105V	1/16W	1M						
R111-114	NN05100610	1/16W	10	R303, 304	ERQ12AJ4R7	1/2W	4.7 △	R474	ERJ2GEYJ102V	1/16W	1K						
R115, 116	NN05561610	1/16W	560	R305, 306	N101473110	1/10W	47K	R479-484	NN05330610	1/16W	33						
R121	ERJ2GEYJ682V	1/16W	6.8K	R307, 308	N101822110	1/10W	8.2K	R485	ERJ2GEYJ102V	1/16W	1K						
R122	NN05683610	1/16W	68K	R309, 310	N101473110	1/10W	47K	R487-490	NN05330610	1/16W	33						
R125	ERJ2GEYJ104V	1/16W	100K	R311-314	N101822110	1/10W	8.2K	R491-498	ERJ2GEYJ472V	1/16W	4.7K						
R127, 128	ERJ2GEYJ102V	1/16W	1K	R315, 316	ERDS2TJ101	1/4W	100	R499	NN05330610	1/16W	33						
R129	ERJ2GEYJ470V	1/16W	47	R317, 318	N101822110	1/10W	8.2K	R605-608	ERDS2TJ123	1/4W	12K						
R130	ERJ2GEYJ471V	1/16W	470	R319, 320	N101562110	1/10W	5.6K	R609, 610	ERDS2TJ561	1/4W	560						
R131	ERJ2GEYJ331V	1/16W	330	R321, 322	N101752110	1/10W	7.5K	R612, 613	ERDS2TJ682	1/4W	6.8K						
R132	NN05561610	1/16W	560	R323, 324	N101562110	1/10W	5.6K	R621	ERDS2TJ102	1/4W	1K						
R133	ERJ2GEYJ822V	1/16W	8.2K	R325, 326	ERJ2GEYJ102V	1/16W	1K	R622	ERDS2TJ273	1/4W	27K						
R134	ERJ2GEYJ123V	1/16W	12K	R327, 328	ERJ2GEYJ272V	1/16W	2.7K	R631, 632	ERDS2TJ153	1/4W	15K						
R136	NN05393610	1/16W	39K	R329, 330	ERJ2GEYJ682V	1/16W	6.8K	R635, 636	ERDS2TJ102	1/4W	1K						
R137-145	ERJ6GEYJ561V	1/10W	560	R331, 332	ERJ2GEYJ101V	1/16W	100	R637, 638	ERDS2TJ103	1/4W	10K						
R146	NN05561610	1/16W	560	R333, 334	ERJ2GEYJ471V	1/16W	470	R641, 642	ERDS2TJ102	1/4W	1K						
R151	ERDS2TJ120	1/4W	12	R335, 336	NN05106610	1/16W	10M	R647, 648	ERDS2TJ332	1/4W	3.3K						
R155	ERDS2TJ2R2	1/4W	2.2	R337-340	NF02100140	1/2W	10 △	R670	ERDS2TJ103	1/4W	10K						
R156	ERDS2TJ181	1/4W	180	R341, 342	ERJ2GEYJ101V	1/16W	100	R671, 672	ERDS2TJ102	1/4W	1K						
R158-166	NN05220610	1/16W	22	R343, 344	ERJ2GEYJ183V	1/16W	18K	R673	ERDS2TJ103	1/4W	10K						
R171, 172	ERJ2GEYJ472V	1/16W	4.7K	R345, 346	ERJ2GEYJ101V	1/16W	100	R674	ERDS2TJ472	1/4W	4.7K						
R180	ERJ2GEYJ102V	1/16W	1K	R347, 348	NN05223610	1/16W	22K	R701, 702	ERDS2TJ123	1/4W	12K						
R181	ERJ2GEYJ331V	1/16W	330	R349	ERJ2GEYJ473V	1/16W	47K	R703, 704	ERDS2TJ152	1/4W	1.5K						
R182	NN05100610	1/16W	10	R350	ERJ2GEYJ153V	1/16W	15K	R705	NF02100140	1/2W	10 △						
R183	ERJ2GEYJ822V	1/16W	8.2K	R351	ERJ2GEYJ104V	1/16W	100K	R706, 707	ERDS2TJ222	1/4W	2.2K						
				R352	N101243110	1/10W	24K	R720, 721	ERDS2TJ473	1/4W	4.7K						
				R363, 364	ERJ2GEYJ332V	1/16W	3.3K	R728, 729	NF02100140	1/2W	10 △						
				R365, 366	ERJ2GEYJ472V	1/16W	4.7K	R732	ERQ12AJ4R7	1/2W	4.7 △						

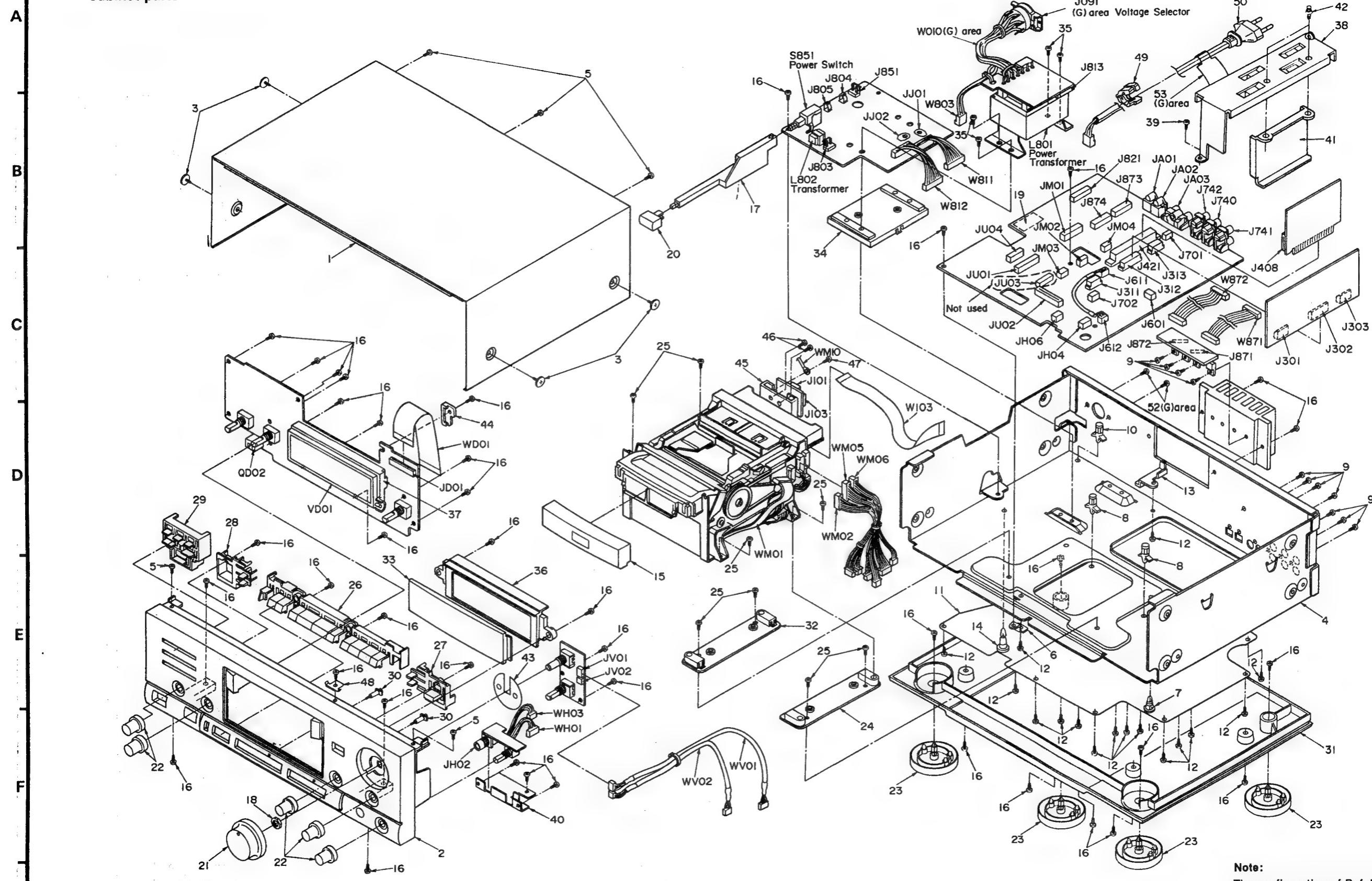
Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
R733, 734	ERDS2TJ101	1/4W 100	RD26	ERDS2TJ151	1/4W 150	RQ59, 60	ERDS2TJ102	1/4W 1K
R751, 752	NF02100140	1/2W 10 △	RD31-38	ERDS2TJ103	1/4W 10K	RQ61, 62	NF02100140	1/2W 10 △
R753, 754	ERDS2TJ473	1/4W 47K	RH02	NF02100140	1/2W 10 △	RQ63	ERDS2TJ103	1/4W 10K
R755, 756	ERDS2TJ102	1/4W 1K	RH04	NF02100140	1/2W 10 △	RQ64	ERDS2TJ473	1/4W 47K
R758, 759	ERDS2TJ101	1/4W 100	RH05, 06	ERDS2TJ473	1/4W 47K	RR51, 52	ERDS2TJ103	1/4W 10K
R761-764	ERDS2TJ221	1/4W 220	RH07, 08	ERDS2TJ103	1/4W 10K	RS01	ERDS2TJ123	1/4W 12K
R767-770	ERDS2TJ221	1/4W 220	RH09, 10	ERDS2TJ223	1/4W 22K	RS04	ERDS2TJ221	1/4W 220
R771, 772	ERDS2TJ104	1/4W 100K	RH11, 12	ERDS2TJ121	1/4W 120	RS06, 07	ERDS2TJ472	1/4W 4.7K
R781-788	ERDS2TJ222	1/4W 2.2K	RH13, 14	ERDS2TJ103	1/4W 10K	RU01-10	ERDS2TJ103	1/4W 10K
R801	RF05010120	1/2W 1 △	RH29, 30	ERDS2TJ103	1/4W 10K	RU11	ERDS2TJ101	1/4W 100
R802	RF05022120	1/2W 2.2 △	RL01, 02	ERDS2TJ103	1/4W 10K	RU12	ERDS2TJ222	1/4W 2.2K
R803-805	RF05010120	1/2W 1 △	RL03, 04	ERDS2TJ104	1/4W 100K	RU14	ERDS2TJ103	1/4W 10K
R806	NH05010140	1/4W 1 △	RL07, 08	ERDS2TJ473	1/4W 47K	RU15	ERDS2TJ102	1/4W 1K
R807	ERDS2TJ472	1/4W 4.7K	RL09, 10	NF02100140	1/2W 10 △	RU16	ERDS2TJ104	1/4W 100K
R808, 809	ERDS2TJ151	1/4W 150	RL11, 12	ERDS2TJ101	1/4W 100	RU17	ERDS2TJ103	1/4W 10K
R810	NF02100140	1/2W 10 △	RM01	ERG1ANJ2R2	1W 2.2 △	RU21	ERDS2TJ472	1/4W 4.7K
R811, 812	ERDS2TJ222	1/4W 2.2	RM02	ERDS2TJ222	1/4W 2.2K	RU23	ERDS2TJ103	1/4W 10K
R813, 814	NF02100140	1/2W 10 △	RM03	ERDS2TJ223	1/4W 22K	RU30	ERDS2TJ103	1/4W 10K
R816	ERDS2TJ103	1/4W 10K	RM04	ERDS2TJ473	1/4W 47K	RU31	ERDS2TJ472	1/4W 4.7K
R820	ERDS2TJ104	1/4W 100K	RM05	ERDS2TJ103	1/4W 10K	RU33	ERDS2TJ103	1/4W 10K
R842	ERDS2TJ104	1/4W 100K	RM21	ERDS2TJ561	1/4W 560	RU51	ERDS2TJ470	1/4W 47
R871, 872	ERDS2TJ104	1/4W 100K	RM22	ERDS2TJ222	1/4W 2.2K	RU53	ERDS2TJ222	1/4W 2.2K
R873	ERDS2TJ103	1/4W 10K	RM23	NH05047140	1/4W 4.7 △	RU54	ERDS2TJ103	1/4W 10K
R971	ERDS2TJ221	1/4W 220	RM24, 25	ERDS2TJ222	1/4W 2.2K	RU55	ERDS2TJ102	1/4W 1K
R972	ERDS2TJ183T	1/4W 18K	RM51	ERDS2TJ561	1/4W 560	RU56	ERDS2TJ473	1/4W 47K
R973	ERDS2TJ221	1/4W 220	RM52	ERDS2TJ222	1/4W 2.2K	RU57	ERDS2TJ102	1/4W 1K
R974	ERDS2TJ183T	1/4W 18K	RM54	ERDS2TJ222	1/4W 2.2K	RU61, 62	ERDS2TJ472	1/4W 4.7K
RA01	ERDS2TJ391	1/4W 390	RM65	ERDS2TJ102	1/4W 1K	RU63	ERDS2TJ102	1/4W 1K
RA02	ERDS2TJ681	1/4W 680	RM56	ERDS2TJ103	1/4W 10K	RU71	ERDS2TJ103	1/4W 10K
RA03	ERDS2TJ822	1/4W 8.2K	RM57	NH05047140	1/4W 4.7 △	RV03, 04	ERDS2TJ102	1/4W 1K
RA04, 05	ERDS2TJ151	1/4W 150	RM58, 59	ERDS2TJ222	1/4W 2.2K			CHIP JUMPERS
RA08	ERDS2TJ104	1/4W 100K	RM82	ERDS2TJ222	1/4W 2.2K			
RA10	ERDS2TJ221	1/4W 220	RM84	ERDS2TJ222	1/4W 2.2K			
RA13	ERDS2TJ390	1/4W 39	RM86	ERDS2TJ222	1/4W 2.2K	CA10	75060501P0	CHIP JUMPER
RA15	ERDS2TJ390	1/4W 39	RM88	ERG1ANJ330	1W 33	J111, 112	ERJ6GEYJ000V	CHIP JUMPER
RD01	ERDS2TJ472	1/4W 4.7K	RM89-91	ERDS2TJ103	1/4W 10K	J121, 122	ERJ6GEYJ000V	CHIP JUMPER
RD02	ERDS2TJ222	1/4W 2.2K	RM92	ERDS2TJ102	1/4W 1K	J151, 152	ERJ6GEYJ000V	CHIP JUMPER
RD03	ERDS2TJ102	1/4W 1K	RM93	ERDS2TJ473	1/4W 47K	J409	ERJ6GEYJ000V	CHIP JUMPER
RD04	ERDS2TJ103	1/4W 10K	RQ01	ERDS2TJ104	1/4W 100K	J441, 442	ERJ6GEYJ000V	CHIP JUMPER
RD05	ERDS2TJ472	1/4W 4.7K	RQ03	ERDS2TJ682	1/4W 6.8K	LA10	75060501P0	CHIP JUMPER
RD06	ERDS2TJ222	1/4W 2.2K	RQ06, 07	ERDS2TJ103	1/4W 10K	R199	R105000180	CHIP JUMPER
RD07	ERDS2TJ102	1/4W 1K	RQ10	ERDS2TJ103	1/4W 10K	R381-383	NN05000610	CHIP JUMPER
RD08	ERDS2TJ103	1/4W 10K	RQ15	ERDS2TJ104	1/4W 100K	R385	NN05000610	CHIP JUMPER
RD09	ERDS2TJ682	1/4W 6.8K	RQ17	ERG1ANJ151	1W 150 △	R387	NN05000610	CHIP JUMPER
RD10	ERDS2TJ472	1/4W 4.7K	RQ21	ERDS2TJ822	1/4W 8.2K	R413	NN05000610	CHIP JUMPER
RD11	ERDS2TJ222	1/4W 2.2K	RQ22	ERDS2TJ331	1/4W 330	R417	NN05000610	CHIP JUMPER
RD12	ERDS2TJ102	1/4W 1K	RQ23	ERDS2TJ105	1/4W 1M	R422	R105000180	CHIP JUMPER
RD13	ERDS2TJ103	1/4W 10K	RQ31, 32	ERDS2TJ104	1/4W 100K	RA06	75060501P0	CHIP JUMPER
RD17	ERDS2TJ822	1/4W 8.2K	RQ51, 52	ERDS2TJ104	1/4W 100K	RH15	75060501P0	CHIP JUMPER
RD18	ERDS2TJ103	1/4W 10K	RQ53, 54	ERDS2TJ223	1/4W 22K	RJ03, 04	NN05000610	CHIP JUMPER
RD19	ERDS2TJ680	1/4W 68	RQ55, 56	ERDS2TJ103	1/4W 10K			CAPACITORS
RD20	ERDS2TJ681	1/4W 680	RQ57, 58	ERDS2TJ472	1/4W 4.7K			

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
C001	0A22405020	50V 0.22U	C221, 222	ECA1EPKS470B	25V 47U	C451	0A47701620	16V 470U
C002	EQ22505030	50V 2.2U	C223, 224	DF15103350	50V 0.01U	C457	ECCF1H151JC	50V 150P
C003	EQ47405030	50V 0.47U	C225-228	ECA1CPKS221B	16V 220U	C471-474	ECCF1H070CC	50V 7P
C004	ECKF1H103ZF	50V 0.01U	C231, 232	ECA1EPKS470B	25V 47U	C601-604	ECA1HPKS4R7B	50V 4.7U
C005	ECA0JPKS221B	6.3V 220U	C251, 252	ECKF1H103ZF	50V 0.01U	C605-608	DF16222310	50V 2200P
C006, 007	DD38104010	25V 0.1U	C301	ECKF1E104ZV	25V 0.1U	C609, 610	EA56405010	50V 0.56U
C031	ECA1HPKS4R7B	50V 4.7U	C302	0A47601050	10V 47U	C611, 612	EA33405010	50V 0.33U
C032	ECA1CPKS100B	16V 10U	C303, 304	ECKF1E104ZV	25V 0.1U	C613	ECA1EPKS100B	25V 10U
C033	ECA1HPKS2R2B	50V 2.2U	C305, 306	0A47601050	10V 47U	C622, 623	ECA1CPKS101B	16V 100U
C101	ECKF1E104ZV	25V 0.1U	C307, 308	ECCF1H390JC	50V 39P	C633, 634	DF16472310	50V 4700P
C102	ECST1CY105	16V 1U	C309, 310	ECQP1H471JZ	50V 470P	C635, 636	ECA1CPKS221B	16V 220U
C103	EY47501640	16V 4.7U	C311, 312	ECCF1H390JC	50V 39P	C637, 638	ECQP1H223JZ	50V 0.022U
C104-111	DK58105200	16V 1U	C313, 314	ECQP1H471JZ	50V 470P	C639, 640	DA16221110	50V 220P
C112	EY10601620	16V 10U	C315, 316	DF15101550	100V 100P	C641, 642	ECQP1H152JZ3	50V 1500P
C113, 114	ECST1CY105	16V 1U	C317, 318	ECKF1E104ZV	25V 0.1U	C671, 672	ECQP1H223JZ	50V 0.022U
C115, 116	EY22500610	6.3V 2.2U	C319, 320	0A47601050	10V 47U	C721, 722	ECA1HPKS4R7B	50V 4.7U
C117, 118	DK96182300	50V 1800P	C321, 322	ECKF1E104ZV	25V 0.1U	C726, 727	ECA1CPKS470B	16V 47U
C119-121	EY10601620	16V 10U	C323, 324	0A47601050	10V 47U	C728, 729	ECA1CPKS221B	16V 220U
C122-132	ECUX1H103KB	50V 0.01U	C325, 326	ECKF1E104ZV	25V 0.1U	C731	ECA1CPKS101B	16V 100U
C133, 134	ECKF1E104ZV	25V 0.1U	C327, 328	0A47601050	10V 47U	C732, 733	DA17473110	50V 0.047U
C135	EY68601020	10V 63U	C329, 330	DF15101550	100V 100P	C740-742	DD38104010	25V 0.1U
C137	EY68601020	10V 63U	C331, 332	DF15102350	50V 1000P	C751, 752	ECBA1H101KB5	50V 100P
C138	ECKF1E104ZV	25V 0.1U	C333, 334	DF15101550	100V 100P	C753, 754	ECA1HPKS4R7B	50V 4.7U
C140	EY68601020	10V 63U	C335, 336	ECA1CPKS221B	16V 220U	C756, 757	ECA1CPKS221B	16V 220U
C141	ECKF1E104ZV	25V 0.1U	C337, 338	ECQM1H333JZ	50V 0.033U	C761-764	ECBA1H221KBY	50V 220P
C143	EY47501640	16V 4.7U	C343-346	ECA1CPKS221B	16V 220U	C801	EA47803510	35V 4700U
C144, 145	DK58105200	16V 1U	C347, 348	ECA1EPKS101B	25V 100U	C802	ECA1VM222B	35V 200U
C150	EY68601020	10V 63U	C349, 350	ECA1CPKS221B	16V 220U	C803, 804	ECA1EM472	25V 4700U
C151, 152	ECKF1E104ZV	25V 0.1U	C351	ECKF1E104ZV	25V 0.1U	C806	ECA1HM471B	50V 470U
C157-165	DK96332300	50V 3300P	C401-406	ECKF1E104ZV	25V 0.1U	C809	ECA1HPKS100B	50V 10U
C181-185	ECKF1E104ZV	25V 0.1U	C409, 410	ECKF1E104ZV	25V 0.1U	C810	DA17473110	50V 0.047U
C190, 191	ECUX1H333ZF	50V 0.033U	C411	ECUX1H103KB	50V 0.01U	C811	ECA1EM472	25V 4700U
C192	DK96102300	50V 1000P	C412	ECKF1E104ZV	25V 0.1U	C812, 813	ECA1CPKS100B	16V 10U
C193	DD95390360	50V 39P	C418	ECCF1H221K	50V 220P	C821	ECKF1H223ZF	50V 0.022U
C194, 195	DK96222300	50V 2200P	C423	EY10601620	16V 10U	C822, 823	ECKF1H223ZF	50V 0.022U △
C196	ECKF1E104ZV	25V 0.1U	C424	EY22600620	6.3V 22U	C824, 825	DA17473110	50V 0.047U △
C201	DF15103350	50V 0.01U	C425	ECKF1E104ZV	25V 0.1U	C826, 827	ECKF1H223ZF	50V 0.022U △
C202	ECKF1E104ZV	25V 0.1U	C426	EY22505040	35V 2.2U	C841, 842	ECA1CPKS221B	16V 220U
C203	ECA1CPKS100B	16V 10U	C427, 428	ECKF1E104ZV	25V 0.1U	C851-853	ECKF1H103KB	50V 101U △
C204	ECKF1E104ZV	25V 0.1U	C429	EY10601620	16V 10U	C861, 862	ECKF1H103KB	50V 101U △
C205, 206	ECA1CPKS100B	16V 10U	C430	ECKF1E104ZV	25V 0.1U	C871	DA17473110	50V 0.047U △
C207	ECKF1E104ZV	25V 0.1U	C431	EY10601620	16V 10U	C872	EA10601620	16V 10U
C208	ECA1CPKS100B	16V 10U	C432	ECCF1H470JC	50V 47P	C873	DA17473110	50V 0.047U
C209	DF15103350	50V 0.01U	C433, 434	ECKF1E104ZV	25V 0.1U	C874	EA10601620	16V 10U
C210	ECKF1E104ZV	25V 0.1U	C440	ECKF1E104ZV	25V 0.1U	C875	DA17473110	50V 0.047U △
C211	ECA1CPKS100B	16V 10U	C441	DK98393200	16V 0.039U	C876	EA10601620	16V 10U
C212-214	ECKF1E104ZV	25V 0.1U	C442	DK58474200	16V 0.47U	C877	DA17473110	50V 0.047U
C215	ECA1EPKS101B	25V 100U	C443-446	ECKF1E104ZV	25V 0.1U	C878	EA47601620	16V 47U
C216	ECKF1E104ZV	25V 0.1U	C447	EY10601620	16V 10U	CA01	ECA1CPKS100B	16V 10U
C217	ECA1EPKS101B	25V 100U	C448	ECCF1H101JC	50V 100P	CA02	DA17473110	50V 0.047U
C218-220	ECKF1E104ZV	25V 0.1U	C449	ECKF1E104ZV	25V 0.1U	CA03	DF15104350	50V 1.1U
			C450	EY10601620	16V 10U	CA04	DD38104010	25V 1.1U

Ref. No.	Part No.	Values & Remarks				
CA05	DA17473110	50V 0.047U				
CA06	0A22605020	50V 22U				
CA07	ECBA1H101KB5	50V 100P				
CA08	DD38104010	25V 0.1U				
CA09	0A22605020	50V 22U				
CA12	ECA1CPXS101B	16V 100U				
CA13	ECBA1H101KB5	50V 100P				
CA14	ECCF1H560J	50V 56P				
CA16	ECCF1H101K	50V 100P				
CA17-19	DD38104010	25V 0.1U				
CD01	EG10601650	16V 10U				
CD02	DD38104010	25V 0.1U				
CD03	EG47601650	16V 47U				
CH01, 02	ECA1CPXS221B	16V 220U				
CH03, 04	ECA1HPXS4R7B	50V 4.7U				
CH05, 06	0A33701620	16V 330U				
CH07, 08	DA17472110	50V 4700P				
CH31, 32	DA17472110	50V 4700P				
CH33	DD38104010	25V 0.1U				
CL01-04	ECA1CPXS100B	16V 10U				
CL05, 06	ECA1CPXS101B	16V 100U				
CM01	ECA1CPXS101B	16V 100U				
CM21, 22	DA17473110	50V 0.047U				
CM51, 52	DA17473110	50V 0.047U				
CQ01	0A22405020	50V 0.22U				
CQ02	0A47405020	16V 0.47U				
CQ04	ECKF1H223ZF	50V 0.022U				
CQ06	DF16222310	50V 2200P				
CQ08	ECA1CPXS101B	16V 100U				
CQ09	DF16222310	50V 2200P				
CQ10	ECKF1H223ZF	50V 0.022U				
CQ21	ECBA1H101KB5	50V 100P				
CQ22	ECKF1H223ZF	50V 0.022U				
CQ51, 52	ECA1CPXS100B	16V 10U				
CQ53, 54	ECA1CPXS470B	16V 47U				
CQ55	ECA1CPXS100B	16V 10U				
CU01	ECA1CPXS470B	16V 47U				
CU02	DD38104010	25V 0.1U				
CU21	ECA1CPXS470B	16V 47U				
CU22	DD38104010	25V 0.1U				
CU31	ECA1HPXS010B	50V 1U				
CU51	ECA1CPXS101B	16V 100U				
CU52	ECA1HPXS100B	50V 10U				
CU53	ECA1HPXS2R2B	50V 2.2U				
CU54	ECA1CPXS101B	16V 100U				
CU81	ECA1CPXS470B	16V 47U				
CU82	DD38104010	25V 0.1U				
CV01, 02	EG10601650	16V 10U				

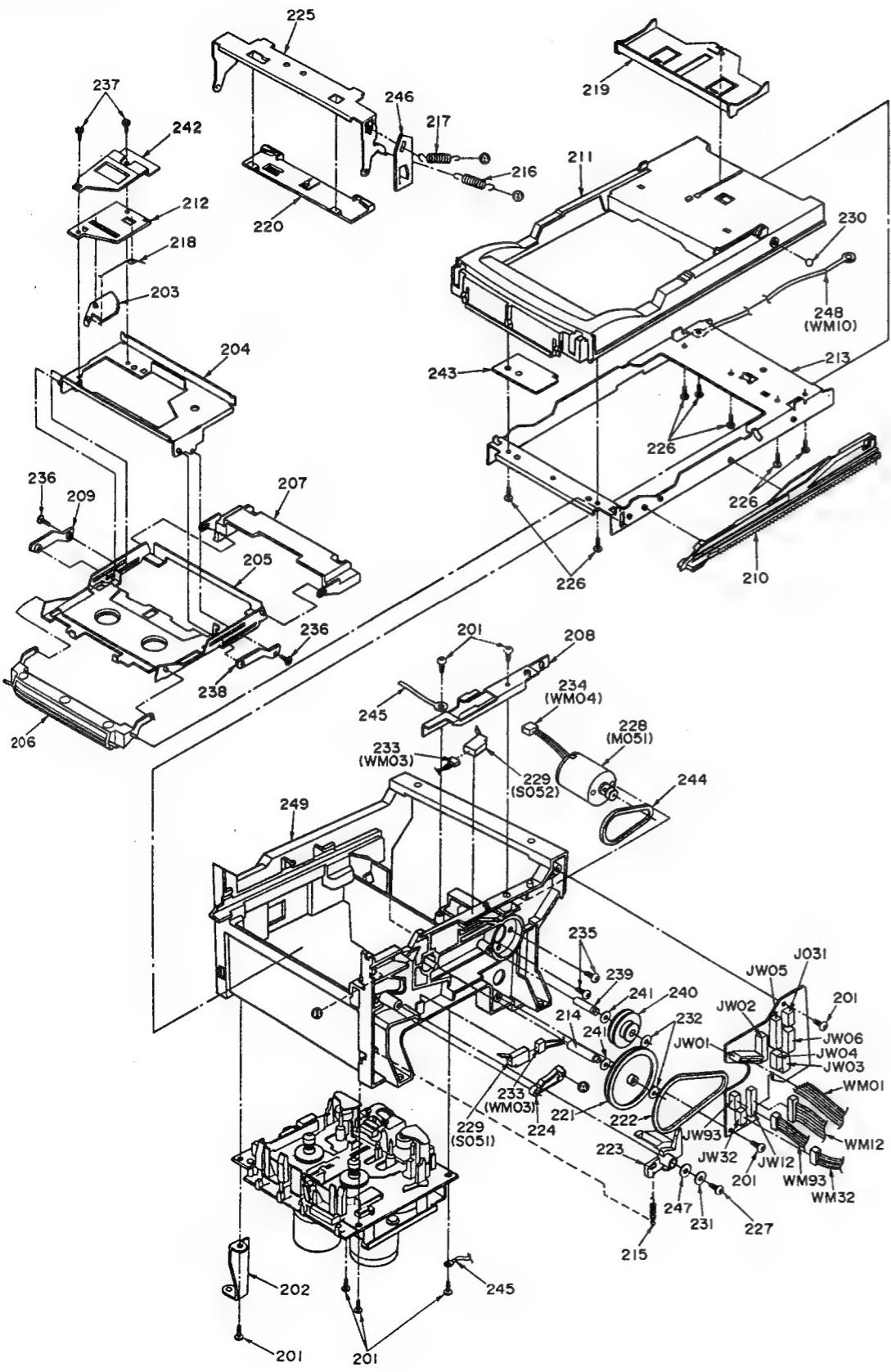
■ EXPLODED VIEWS

- Cabinet parts



Note:
The configuration of Ref. No. 50 (AC power supply cord) differs according to area.

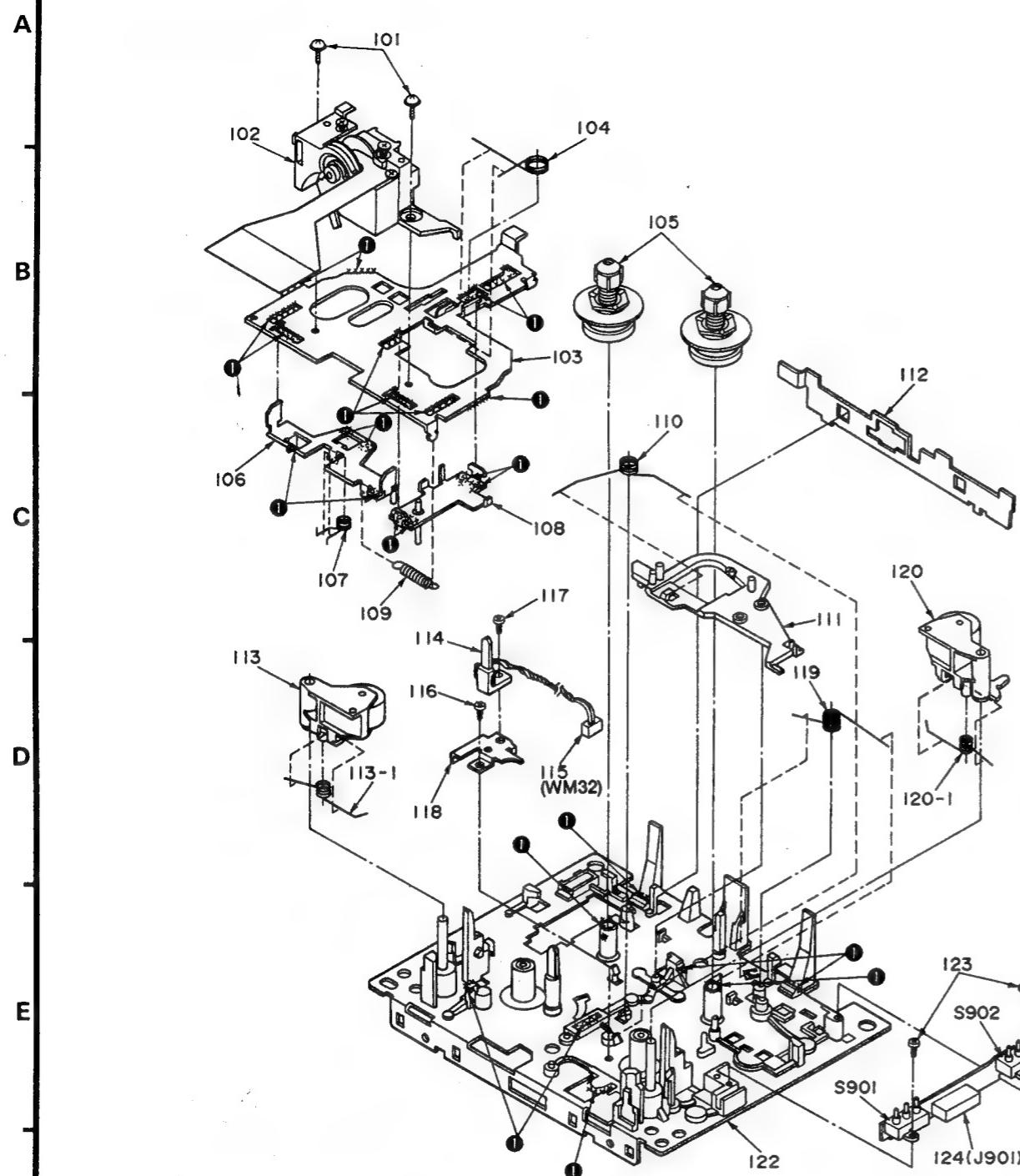
• Loading Parts



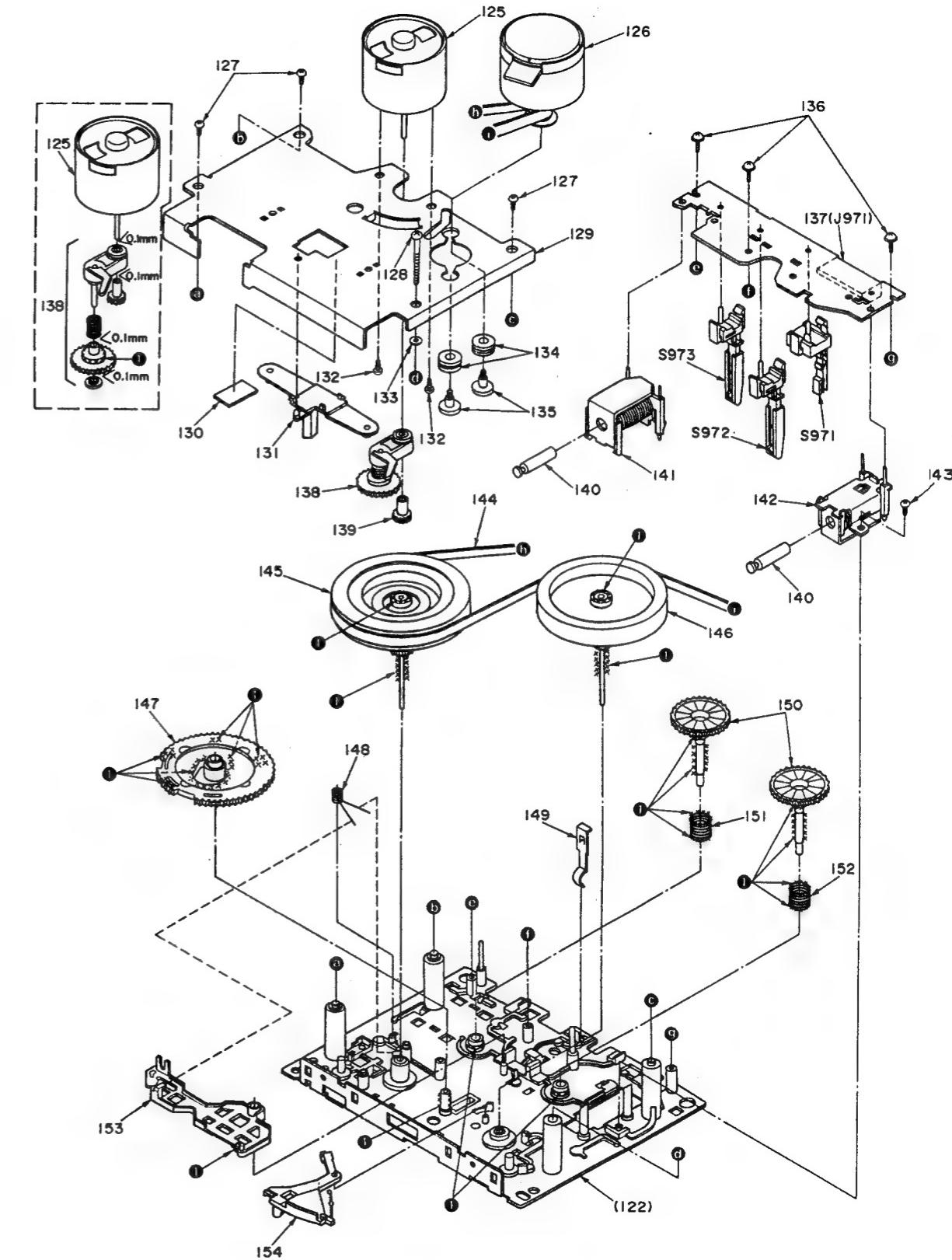
1 2 3 4 5 6 7 8 9

• Mechanical parts

(Top view)



(Bottom view)



Note:

When changing mechanism parts,
apply the specified grease to areas
marked "x x" as shown in the
drawing.

Ref. No.	Part Name	Part No.
●	FLOIL AK-152	SZZ0L18

■ REPLACEMENT PARTS LIST

Notes: *Important safety notice:
 Components identified by Δ mark have special characteristics important for safety.
 Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
 When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
 *The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
 Parts without these indications can be used for all areas.
 *Remote Control Ass'y:
 Supply period for three years from termination of production.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS		41	009D109010	SHIELD PLATE	
1	RFKNSDC10PPK	TOP COVER ASS'Y		42	173HD05010	CLAMPER	
2	RFKGSDC10PPK	FRONT PANEL ASS'Y		43	009D109390	SHIELD PLATE, REC VR	
3	011D010010	SCREW		44	009D101010	HOLDER	
4	RFKHSDC10G-K	CHASSIS ASS'Y	(G)	45	009D160110	BRACKET, READ/WRITE P. C. B.	
4	RFKHSDC10EGK	CHASSIS ASS'Y	(EG)	46	XTB26+4J	SCREW	
4	RFKHSDC10EBK	CHASSIS ASS'Y	(EB)	47	51100306S0	SCREW	
5	XTBS3+10JFZ	SCREW		48	011D123030	CONTACTOR	
6	009D104130	RETAINER, MAIN P. C. B.		49	450H259010	BUSHING, AC P. SUPPLY CORD	
7	467H118010	SPACER, MAIN P. C. B.		50	YC01800610	AC POWER SUPPLY CORD, WD01	(EG, G) Δ
8	054J101040	P. C. B. SUPPORT		50	YC01800620	AC POWER SUPPLY CORD, WD01	(EB) Δ
9	237K010010	SCREW		52	51100306S9	SCREW	(G)
10	054J101050	P. C. B. SUPPORT		53	RQLA0134	CAUTION LABEL (VOL. SELECTOR)	(G)
11	009D257120	BOTTOM LID				LOADING PARTS LIST	
12	XTB3+6JFZ	SCREW		201	XTB3+8JFZ	SCREW	
13	011D104010	RETAINER, MAIN P. C. B.		202	009D109140	BRACKET	
14	045H118010	SPACER, POWER P. C. B. SUPPORT		203	009D002500	ARM KIT	
15	RFKNSDC10CK	CASSETTE TRAY ASS'Y		204	009D104500	RETAINER KIT	
16	XTB3+8JFZ	SCREW		205	009D163500	TRAY KIT	
17	011D121010	POWER SWITCH LINK		206	009D002010	ARM	
18	XNS7D	NUT		207	009D002020	ARM	
19	147T118010	SPACER		208	009D051010	GUIDE	
20	RGU0030	BUTTON, POWER		209	009D005020	CLAMPER	
21	011D154020	KNOB, REC LEVEL		210	009D058010	GEAR	
22	009D154060	KNOB, TIM/NR/SEL/BAL/LP		211	009D064010	CASE	
23	RKA0009-1	FOOT		212	RFKNSDC10PPA	RETAINER ASS'Y	
24	009D104120	RETAINER, MECHA BRACKET(R)		213	009D105010	CHASSIS	
25	XTB3+20JFZ	SCREW		214	009D112010	SHAFT	
26	011D270120	BUTTON, MECHA: OPERATION		215	009D115010	SPRING	
27	009D270130	BUTTON, TEXT/COUNTER/TRAY		216	009D115020	SPRING	
28	009D270040	BUTTON, COUNTER/REPEAT		217	009D115030	SPRING	
29	009D270050	BUTTON, MARKER CONTROL		218	009D115040	SPRING	
30	011D355020	PLAY/REC INDIKET LENS		219	009D127010	CONTROL BORAD	
31	RFKJSDC10EGK	BOTTOM BOARD ASS'Y		220	009D252010	PAD	
32	009D104120	RETAINER, MECHA BRACKET(L)		221	009D262010	PULLEY	
33	011D158010	FL WINDOW		222	009D264010	BELT	
34	009D104110	RETAINER, TRANS BRACKET		223	009D354010	LEVER	
35	51280315A0	SCREW		224	009D354020	LEVER	
36	011D160020	BRACKET, FL WINDOW		225	009D354030	LEVER	
37	009D271010	FL HOLDER		226	51302605U0	SCREW	
38	009D104150	RETAINER, DCC P. C. B.		227	XTB3+10JFZ	SCREW	
39	51280310B0	SCREW		228	RFKPSDC10PPK	D. C. MOTOR ASS'Y(M051)	
40	011D160010	BRACKET, HEADPHONES		229	SS01020590	SLIDE SWITCH(S051, 052)	

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
230	61050010T0	BALL		129	RMA0048	FLYWHEEL PLATE	
231	54110149A0	WASHER		130	RMQ0325	SPACER	
232	009D114210	WASHER		131	RMD5014ZC	THRUST ANGLE	
233	YB00141200	CONNECTIVE CORD(4P), WM03		132	XSN26+3	SCREW	
234	YB00121590	CONNECTIVE CORD(3P), WM04		133	RHW31002	WASHER	
235	XSB3+4FZ	SCREW		134	RHG3032ZA	CUSHION	
236	XSN17+4BN	SCREW		135	RHD26002	SCREW	
237	51821702S0	SCREW		136	XTW2+8S	SCREW	
238	009D005010	CLAMPER		137	RJS9T7ZA	CONNECTOR(9P), J971	
239	009D112050	SHAFT		138	RXG0009	IDLER GEAR ASS'Y	
240	009D262020	PULLEY		139	RDG0034	REEL MOTOR GEAR	
241	59035402G9	WASHER		140	RUB428ZE	MOVING IRON CORE	
242	009D116020	SPACER		141	RSJ0003	SOLENOID	
243	009D116010	SPACER		142	RXQ0011	BRAKE SOLENOID	
244	009D264020	BELT		143	XTN26+4F	SCREW	
245	009D005030	HADIE CORD		144	RDV0015	CAPSTAN BELT	
246	009D269010	ANGLE		145	RXF0007	FLYWHEEL (F)	
247	5906950569	SPACER		146	1DW0054YA	FLYWHEEL (R)	
248	YB00151850	CONNECTIVE CORD, WM10		147	RDG0221	MAIN GEAR	
249	RFKNSDC10PPB	FRAME ASS'Y		148	RW147ZA	TRIGGER LEVER SPRING	
		MECHANISM		149	RUS6092C	SPRING	
101	XTW2+6L	SCREW		150	RXG0003	REEL TABLE GEAR	
102	RFKNSDC10-K	HEAD BLOCK (R/P) ASS' Y		151	RMB0298	BACK TENSION SPRING R	
103	RMK0152	HEAD BASE		152	RMB0299	BACK TENSION SPRING L	
104	RMB0229	SPRING, HEAD BASE		153	RML0037	TRIGGER LEVER	
105	RXP0013	REEL TABLE		154	RML0038	LEVER	
106	RFKRSDC10CK	ROD ASS' Y				PACKING MATERIAL	
107	RW143ZA	SPRING					
108	RFKRSDC10BK	MAIN ROD		P1	011D801010	PACKING CASE	(G, EG)
109	RUD105ZA	SPRING		P1	011D801040	PACKING CASE	(EB)
110	RME0020	SPRING, BRAKE		P2	011D809110	CUSHION (FRONT)	
111	RML0040-2	BRAKE LEVER		P3	011D809120	CUSHION (BACK)	
112	RMA0550	PLATE		P4	157K811010	PROTECTION COVER(UNIT)	
113	RXP0005	PINCH ROLLER ARM		P5	X2B24X33C04	PROTECTION BAG (F. B., ACC.)	
113-1	RW141ZA	SPRING, PINCH ROLLER					
114	SPI-306-03	END SENSOR				ACCESSORIES	
115	REXD419Y	READ WIRE BLOCK(3P), WM02		A1	RFKSSDC10EGK	INSTRUCTION MANUAL ASS' Y	(EG)
116	XQN2+CM25	SCREW		A1	RFKSSDC10G-K	INSTRUCTION MANUAL ASS' Y	(G)
117	XSN2+4	SCREW		A1	011D851040	INSTRUCTION MANUAL	(EB)
118	RMA0551	SENSOR ANGLE		A2	SFDHM03N02	STEREO CONNECTION CABLE	
119	RW142ZA	SPRING		A3	ZK011D0020	REMOTE CONTROL TRANSMITTER	
120	RXP0004	PINCH ROLLER ARM(F)		A4	YJ04001280	POWER PLUG ADAPTOR	(G) △
120-1	RW140ZC	SPRING, PINCH ROLLER ARM(F)		A5	RQA0013	WARRANTY CARD	(EB, EG)
122	RFKRSDC10AK	CHASSIS ASS' Y					
123	XTB2+6J	SCREW					
124	SJTD613	CONNECTOR(6P), J901					
125	MMN-6F4RA88	REEL MOTOR					
126	RFM133ZA	DC MOTOR					
127	XTN26+7J	SCREW					
128	XTN26+26F	SCREW					



Service Manual

Digital Compact Cassette Deck

RS-DC10

Supplement

Please file and use this supplement manual together with the service manual for Model No. RS-DC10, Order No. AD9209339C1 (PP), AD9209340C8 (EB, EG, G).

Note: This supplement is intended to provide additional information or corrections to the existing service manual for Model No. RS-DC10. Be sure to update your service manual for future reference.

Area	Colour	(K) ... Black Type
Suffix for Model No.	Area	Colour
(PP)	U.S.A./Canada.	(K)
(EB)	Great Britain.	
(EG)	Germany, Italy and Europe.	
(G)	Asia, Latin America, Middle Near East and Africa.	

FOR USE OF ADJUSTMENT

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Technics

■ CAUTION !

- 1** Connect a wrist strap (RFKZ0036) to the meter's ground terminal. Always wear a wrist strap when replacing the heads or inspecting or repairing a P.C.B. to prevent electrostatic breakdown.

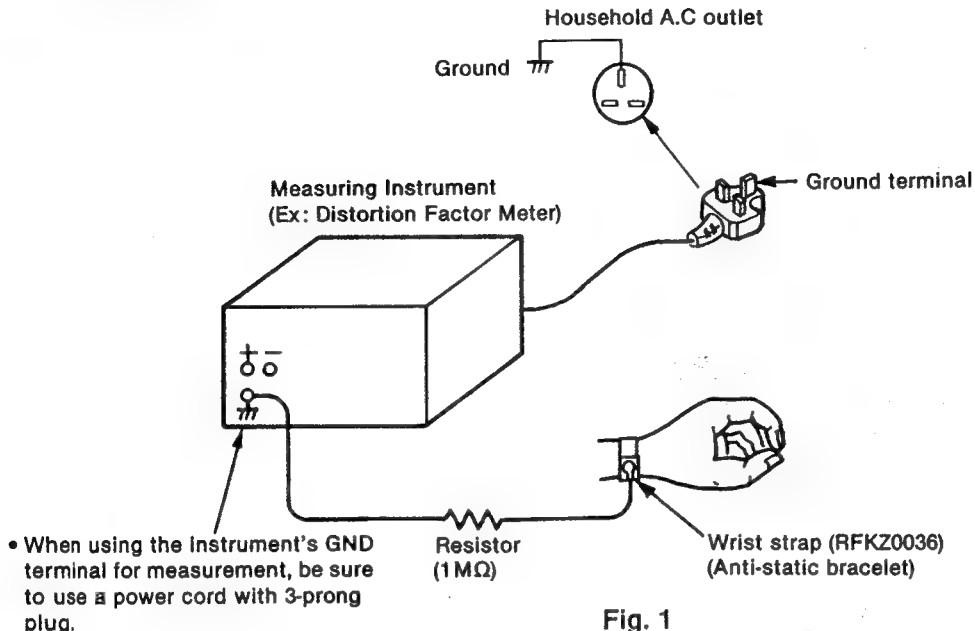


Fig. 1

- 2** When removing the head FPC from the READ/WRITE P.C.B., always attach a shorting clip to the FPC to prevent electrostatic breakdown.

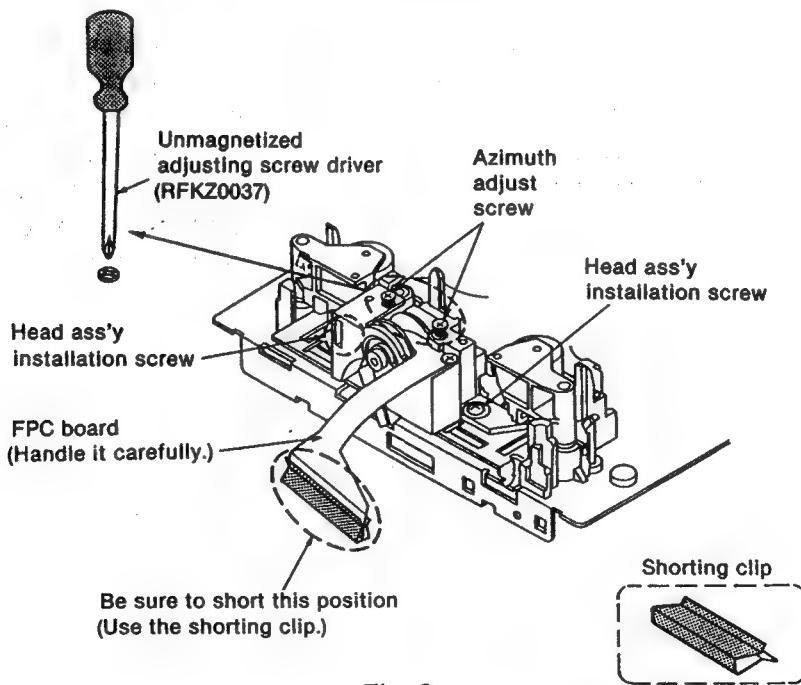


Fig. 2

- 3** Use the unmagnetized adjusting screw driver (RFKZ0037) for replacing the head and for AZTEC adjustment.
(The head may be damaged by an external magnetic field.)

■ PREPARATION FOR ADJUSTMENTS

- How to use Extension cables (RFKZ0029, RFKZ0030, RFKZ0031) for Adjustment

Extension cable	P.C.B. to P.C.B.
RFKZ0029	Main P.C.B. ↔ Mechanism Block (JW02/05/06) (See Fig. 3)
RFKZ0030	PASC P.C.B. ↔ Read/Write P.C.B. (See Fig. 4)
RFKZ0031	Main P.C.B. ↔ PASC Digital P.C.B. (See Fig. 4)

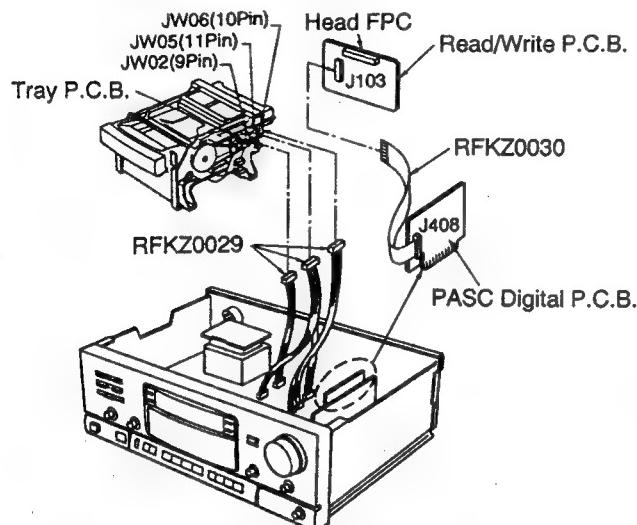


Fig. 3

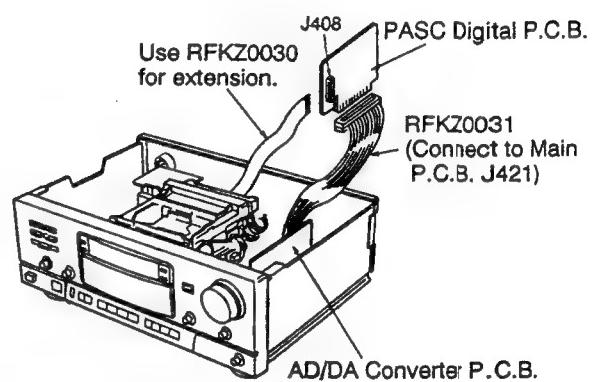


Fig. 4

- Necessary Test tapes for each adjustment

Part No.	Name	Use
QZZCAC	10kHz Test tape	AZTEC adjustment
QZZCRD	Mirror tape	
RFKZ0033	DCC Blank tape	Optimum DCC recording current adjustment
RFKZ0032	DCC Characteristics tape	DCC playback level adjustment and Error Rate check
QZZCFM	ACC Test tape	Analog feedback adjustment
		Minimum analog output distortion adjustment
		Analog output frequency response characteristics adjustment
RFKZ0038	Dolby level tape	Dolby level adjustment
QZZCWAT	3kHz Test tape	Tape speed adjustment

- Necessary tools and measuring instruments

Tools

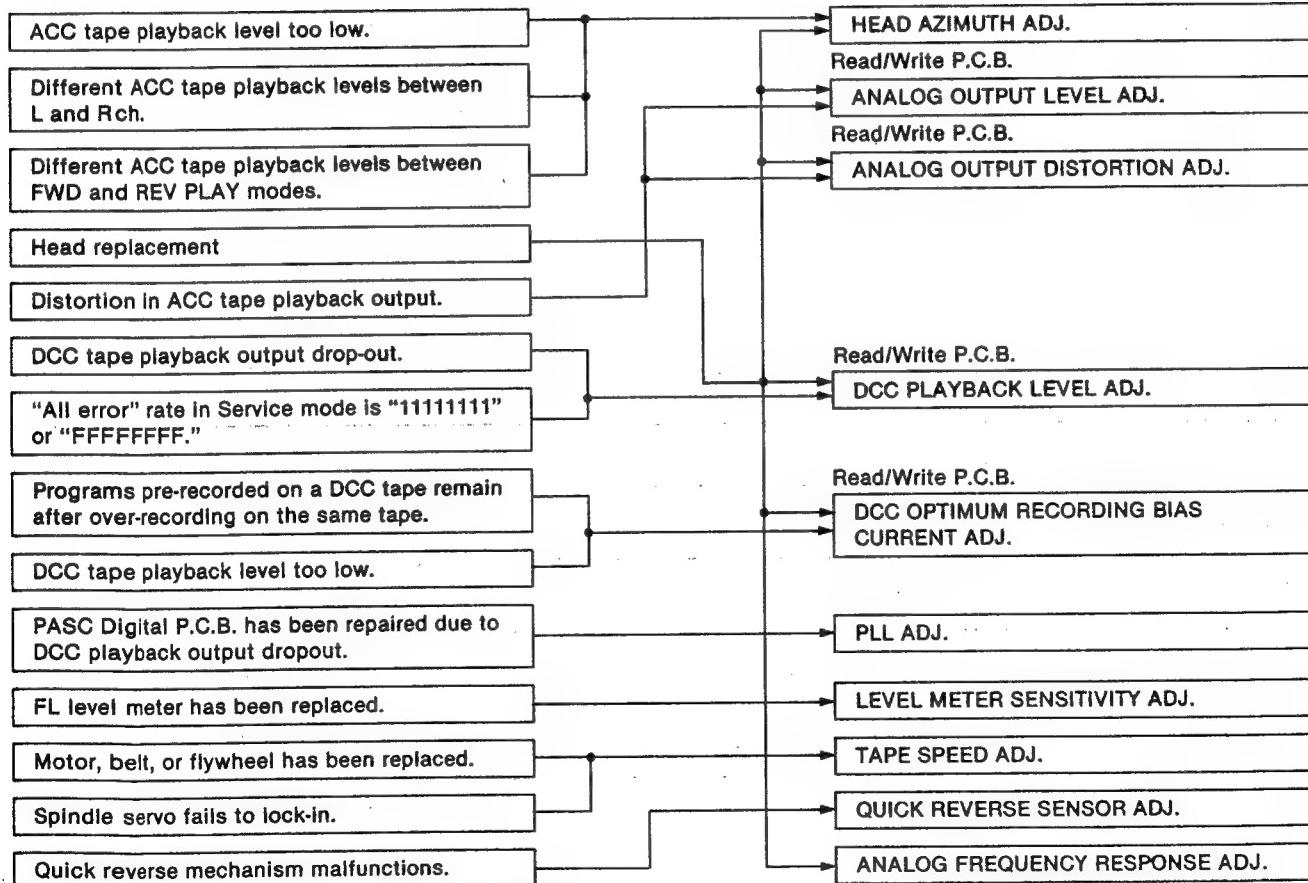
Unmagnetized adjusting screw driver (RFKZ0037)
CD player (EX: SL-PS700, SL-PS900 etc.)

Measuring Instruments

Oscilloscope (30 MHz or Higher)
Distortion Factor Meter
Frequency Counter
Electric Volt Meter (AC/DC)

■ EXAMPLES OF PROBLEMS WHICH REQUIRE ADJUSTMENT

Problem or Repair Requiring Adjustment



■ WHAT YOU SHOULD KNOW BEFORE ADJUSTMENT

The DCC head block employs the AZTEC mechanism.
AZTEC plays an important role in stabilizing the running of the tape relative to the head.

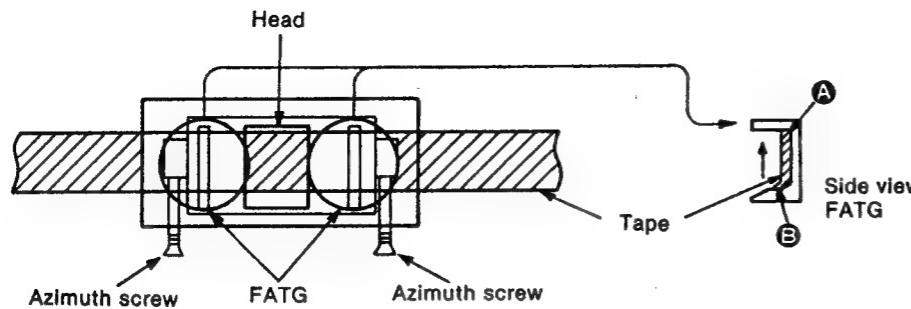


Fig. 1

The Fixed Azimuth Tape Guidance (FATG) has a different shape above and below the tape. The upper part **A** is the guiding surface for the tape's upper edge. The slanted area of the lower part **B** is structured so that the tape moves itself upwards. The tape usually runs along the upper guiding surface **A**.

When the head has been replaced, be sure to adjust the AZTEC.

① Head is too low relative to the tape hub.

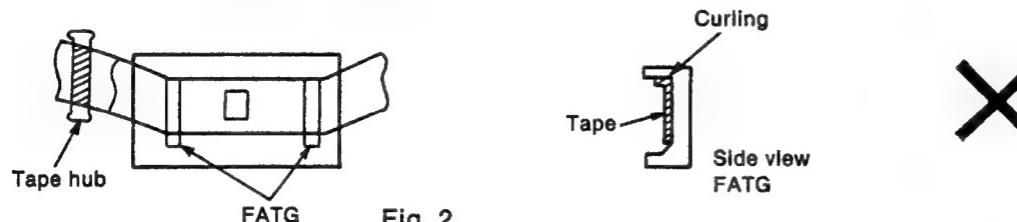


Fig. 2

② Head and tape hub are correctly aligned.

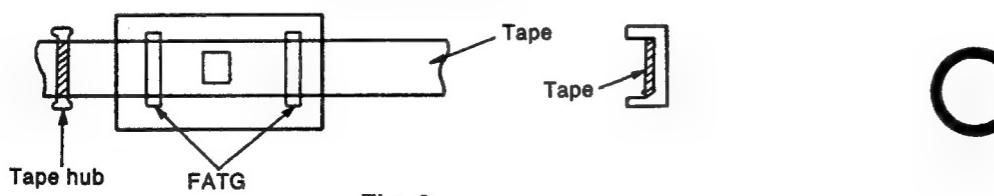


Fig. 3

③ Head is too high relative to the tape hub.



Fig. 4

* If condition ① or ③ occurs, adjust the azimuth screws to obtain the correct position (as shown in ②).

• Front Panel

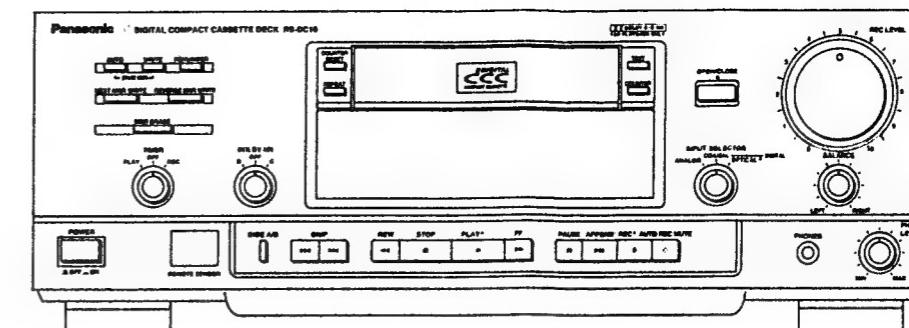


Fig. 5

• Rear Panel

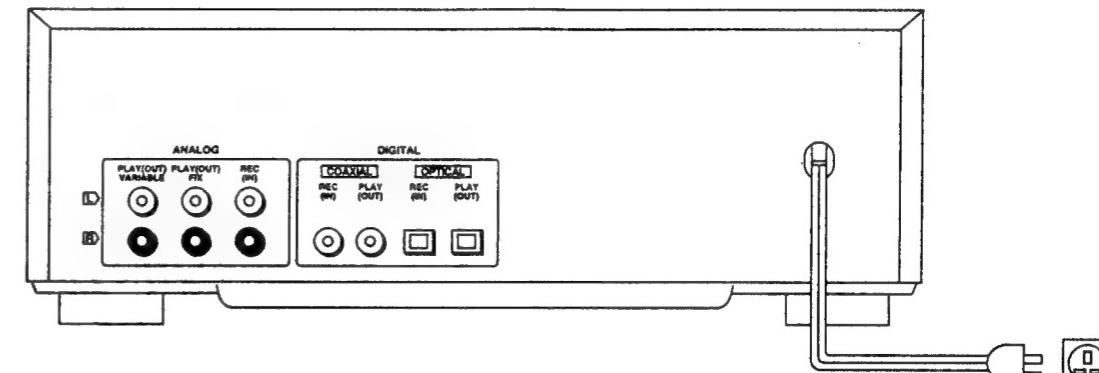
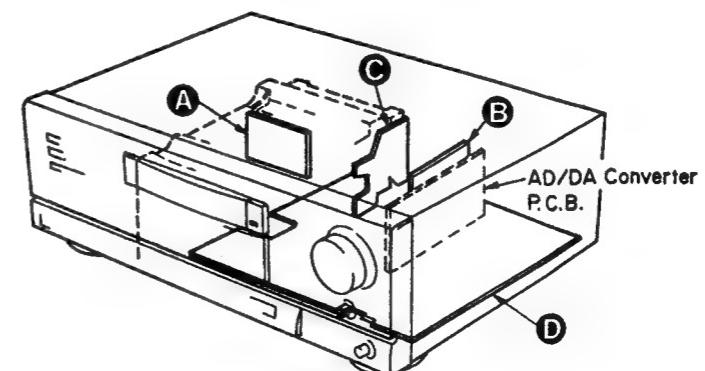


Fig. 6

• P.C.B. Location



- A** READ/WRITE P.C.B.
- B** PASC DIGITAL P.C.B.
- C** TRAY P.C.B.
- D** MAIN P.C.B.

Fig. 7

■ ADJUSTMENT

1. AZTEC ADJUSTMENT

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. Mirror tape (QZZCRD) 2. 10kHz Test tape (QZZCAC) 3. Unmagnetized adjusting screw driver (RFKZ0037) 4. Wrist strap (RFKZ0036)	1. Oscilloscope (30MHz or higher)	

Fig. 1

• Adjustment Steps

- (1) Trigger on CH1.
- (2) Remove the tape control lever from the tray mechanism.

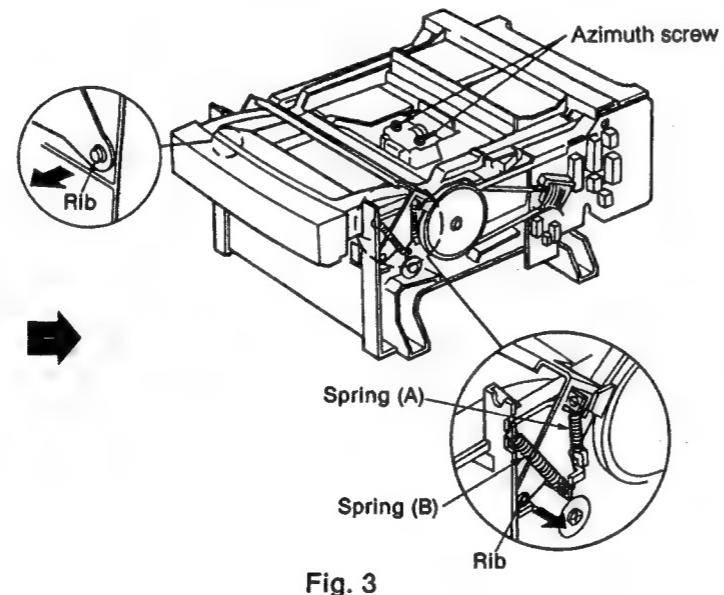
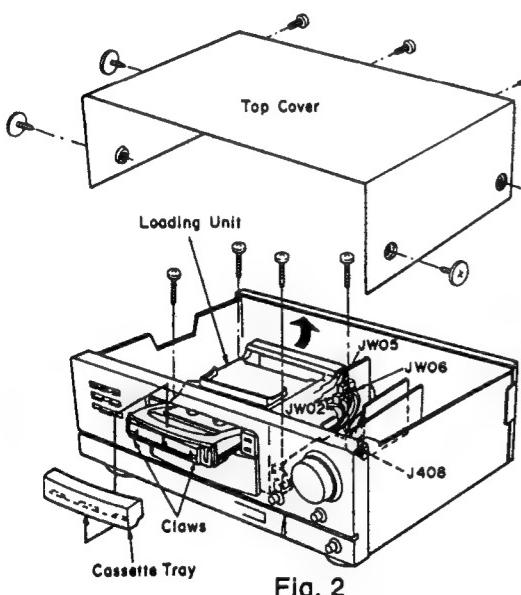


Fig. 2

Fig. 3

• Rough Adjustment

STEP 1

1. Using the Mirror tape (QZZCRD): Adjust the Azimuth screws so that the Mirror tape (QZZCRD) runs over the center of the head.
2. Not using the Mirror tape (QZZCRD): While playing back the 10kHz Test tape (QZZCAC), adjust the Azimuth screws to attain a peak on one channel (RCH) only.

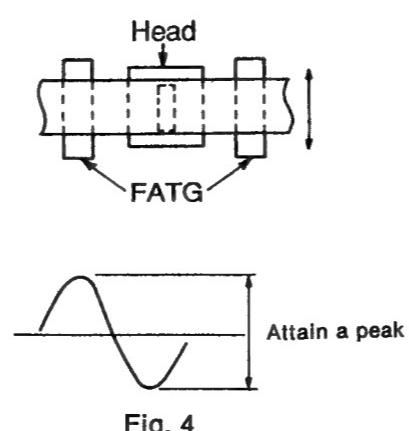


Fig. 4

• Fine Adjustment

STEP 2 Forward side adjustment

To adjust in the forward direction, use the right side Azimuth screw.
Do not touch the left side Azimuth screw (Fig. 5).

1. Run the 10kHz Test tape (QZZCAC) to its middle. Press a finger on the shaded area (Ⓐ) and run the tape. (To keep the cassette from floating.)
2. While keeping your finger in the position given in Fig. 5. Press another finger on the head of the Supply reel cap, and turn the right side Azimuth screw to the right. (Control the range of movement to the left and right of the CH1 waveform.)

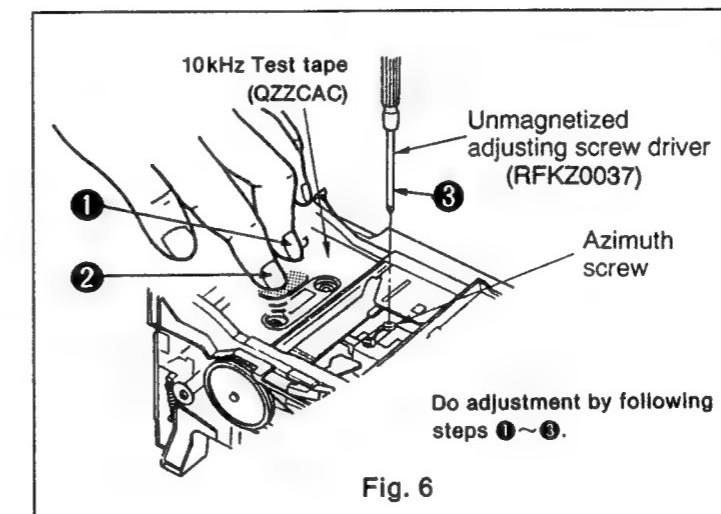
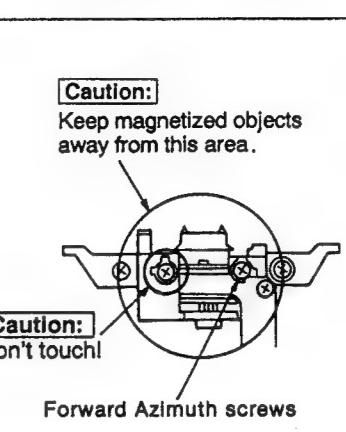


Fig. 6

• Adjustment Points



Forward Azimuth screws

Fig. 5

Procedure

- ① Stop the right side Azimuth screw at the point where only the CH2 waveform starts to move Ⓐ.

Reference figure

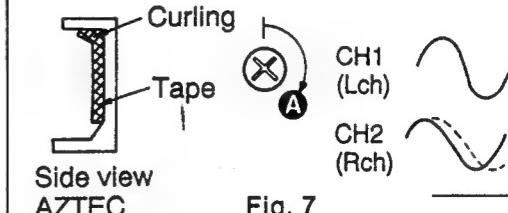


Fig. 7

- ② Turn the Azimuth screw to the left until the point where the waveform starts to move in the opposite direction Ⓑ.

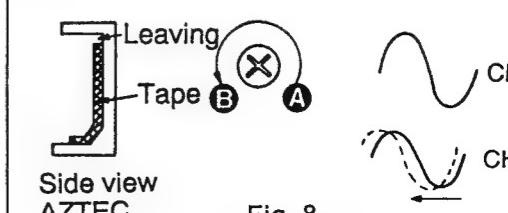


Fig. 8

- ③ Turn the Azimuth screw to halfway between Ⓐ and Ⓑ.

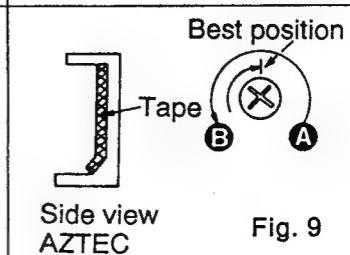


Fig. 9

STEP 3 Method of verification

1. Connect the oscilloscope to the AZCHK terminal of the PASC DIGITAL P.C.B. (Fig. 11).
2. Playback the DCC Characteristics tape (RFKZ0032).
 - If the pulse width shown is within 150μsec, the adjustment is good (Fig. 10).
3. Otherwise, re-adjust starting with **STEP 1** (Refer to page 7).

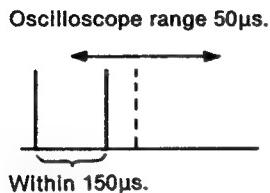


Fig. 10

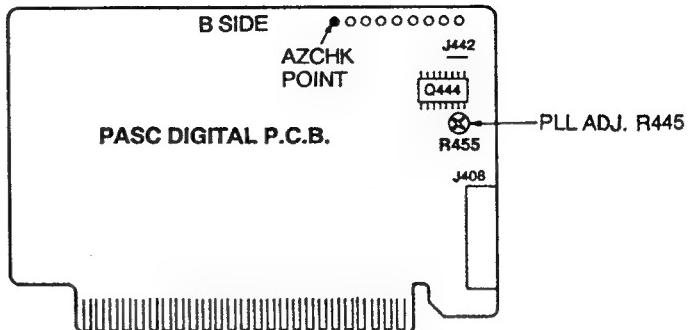
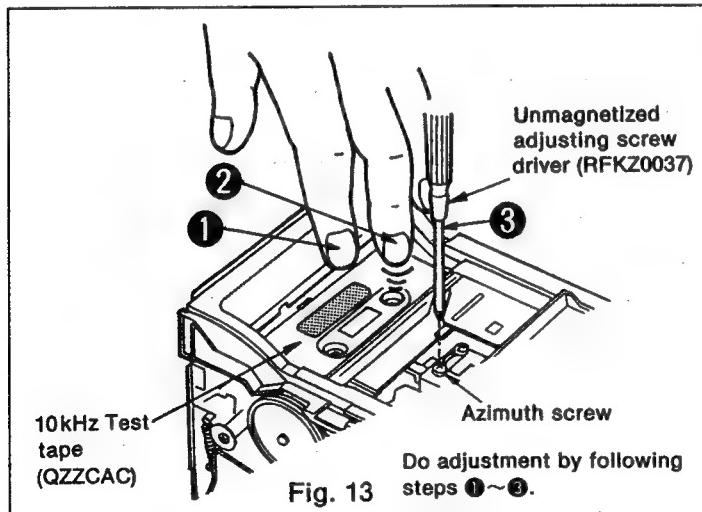
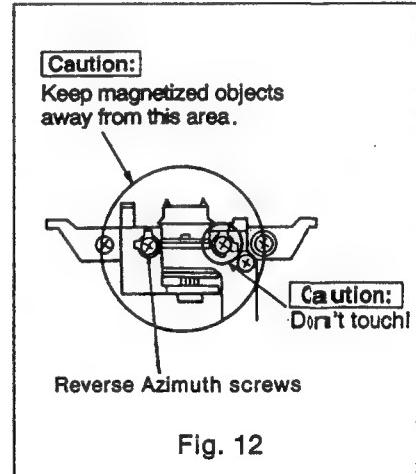


Fig. 11

STEP 4 Reverse side adjustment

To adjust in the reverse direction, use the left side Azimuth screw.
Do not touch the right side Azimuth screw (Fig. 12).

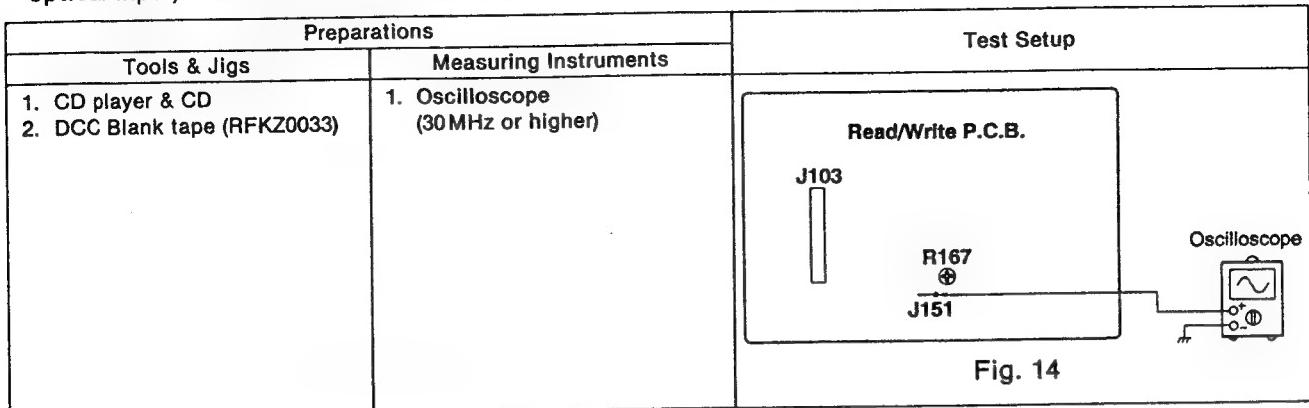
1. Reverse playback the 10kHz Test tape (QZZCAC).
(Control the tape with your finger.)
2. While reverse playing and keeping your finger pressed on the Supply reel cap (to apply a load), turn the left side Azimuth screw as was done for the forward side adjustment (Fig. 13).

**• Adjustment Points**

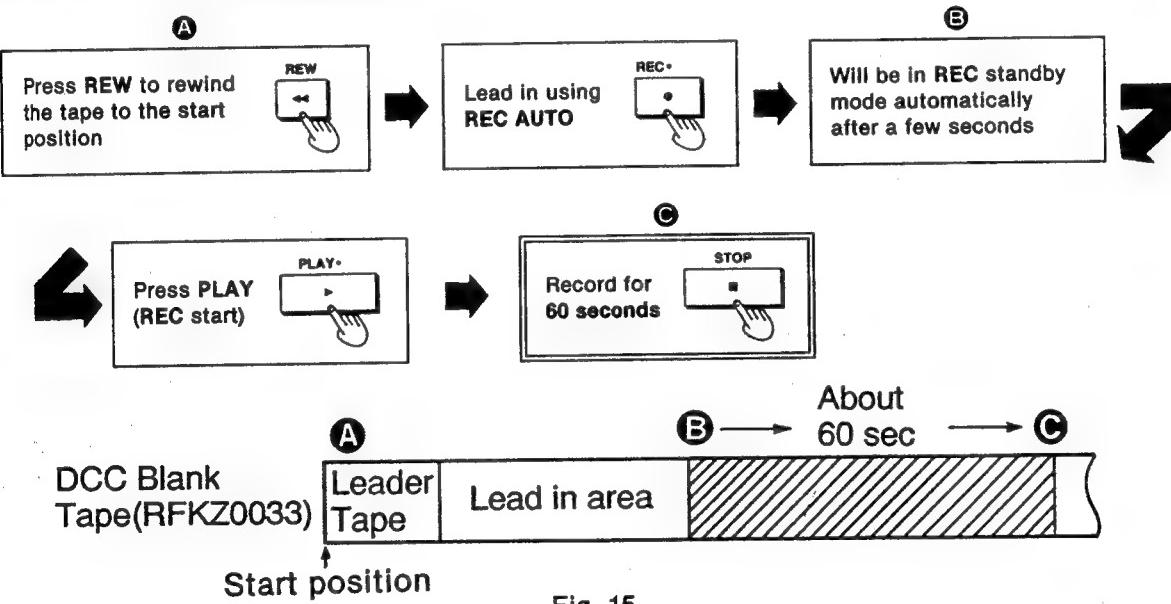
3. The method of verification is also the same.

2. OPTIMUM DCC RECORDING CURRENT ADJUSTMENT (READ/WRITE P.C.B.)

- Connect the CD player output terminal with the DCC recording terminal (either analog input, digital input, or optical input). Record the CD sound onto the DCC Blank tape (RFKZ0033). This recording gives A-time.



[How to do A-time recording]



• Adjustment Steps

- Put the unit in REC mode using an unrecorded section of the DCC Blank tape (RFKZ0033).
- Adjust potentiometer R167 to obtain the optimum voltage on the output level of J151.

* How to find the optimum voltage

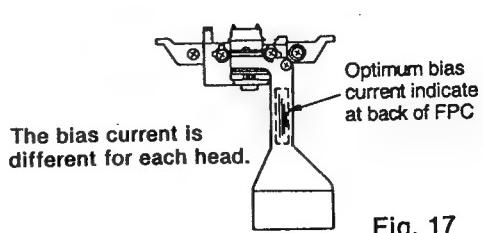
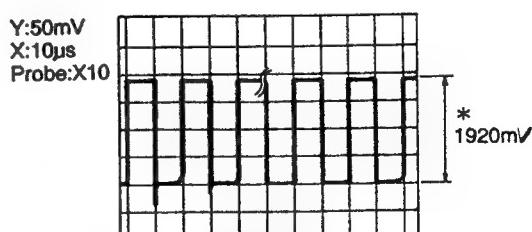
The bias current indicated on the back of the FPC of each head is found using the following formula:

$$V = I \times R_{151} (12\Omega)$$

Example:

When the bias current is 160mA:

$$V = 160\text{mA} \times 12\Omega = 1920\text{mV}$$



(I) Method of Verification (Must be performed after adjustment.)

Overwrite with another music source part of the section that was recorded during preparation.

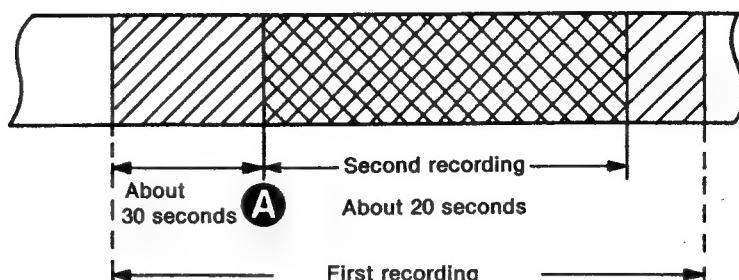
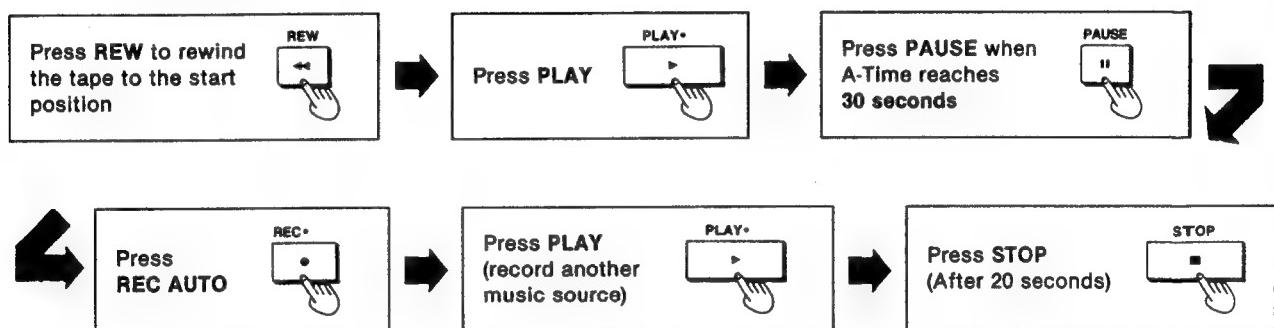


Fig. 18

[How to overwrite]



(II) Verification Items

Rewind the tape and play it back, and check the following at the breaks between tracks.

1. Check that A-Time is played back.
(Fails if the recording current is low.)
2. Check the Error Rate
 - ① Stop after about 25 seconds from the tape start position.
 - ② Turn off the power so that "ALL • ERR • RATE" is displayed in the service mode, and play the tape again. (Refer to page 12)
 - ③ Confirm that "00 0000000" remains on the display, although the Error Rate is momentarily worse than this at A-Time (5 seconds after the initial 25 seconds).

(III) Viewing the "Error Rate"**(1) Setting the Error Rate mode**

1. Turn the POWER off. While pressing both the STOP key and the PLAY key, turn the POWER on.
2. [SERVICE MODE] is displayed.

! , + , - , / 0 1 2 3 4 5 6 7 8 9
< = > 7 A B C D E F G H I J K L M N
O P Q R S T U V W X Y Z

are scrolled in order.

Press the COUNTER key on the DCC seven times.
ALL • ERR • RATE is displayed.

Place a pre-recorded tape into the machine and press the PLAY key.

3. Ten characters (numbers or letters) will be displayed on the display section.
This display shows the Error Rate on each of 8 CH signal tracks and the AUX CH.
The signal drop-out condition for each channel is displayed using the hexadecimal digits 0-9, A-F.

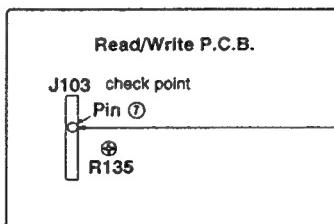
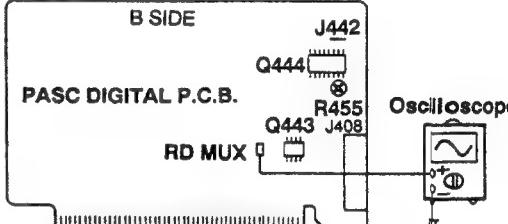
Aux CH	CH	1	2	3	4	5	6	7	8
00		0	0	0	0	0	0	0	0
		{							
		9							
		A							
		{							
		F	F	F	F	F	F	F	F

(2) Error Rate acceptability criteria

Display	Condition
"00000000" is constantly displayed for all tracks.	Normal (OK)
"01101000" is momentarily displayed for any one to three tracks (or more).	Normal (OK)
"11111111" is constantly displayed for one to three tracks (or more). Anything but "0" is displayed.	Error
"11111111" is constantly displayed for all tracks. Anything but "0" is displayed.	Error
"FFFFFFF" is constantly displayed for all tracks.	Error

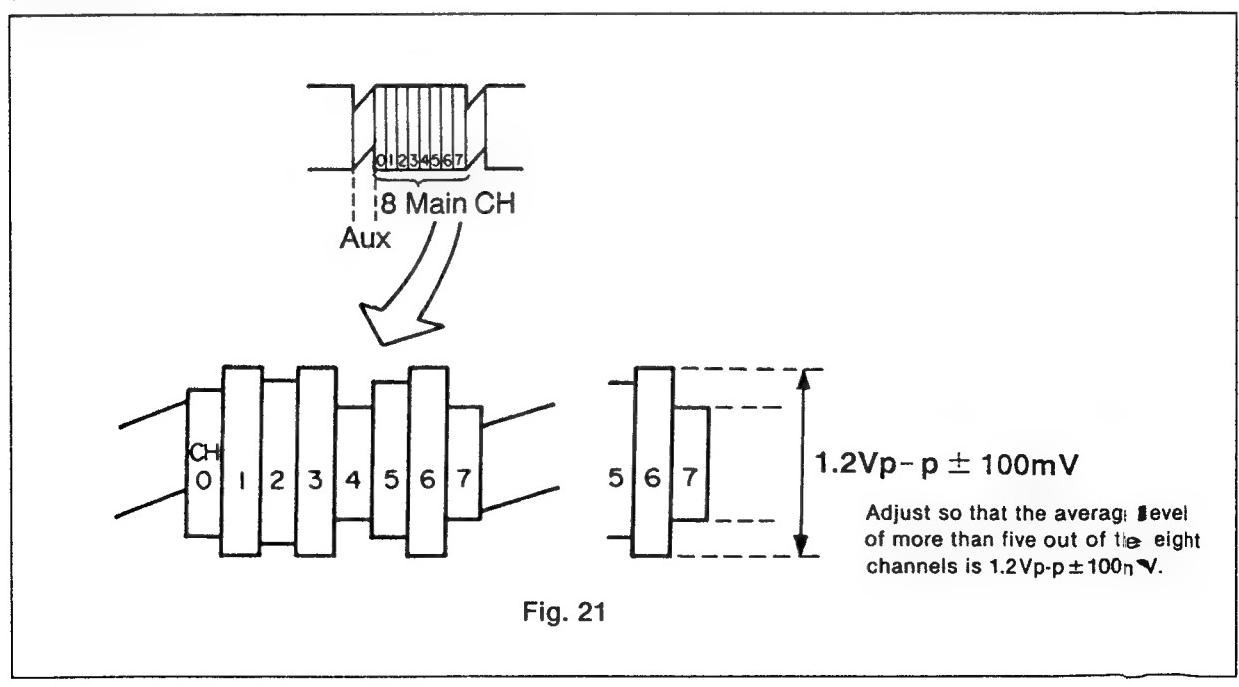
3. DCC PLAYBACK LEVEL ADJUSTMENT (READ/WRITE P.C.B. or PASC DIGITAL P.C.B.)

- The purpose of this adjustment is to feed digital signals at the specified level from the DCC RF circuit to the PASC Digital circuit.

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. DCC Test tape (RFKZ0032) 2. Screwdriver (-)	1. Oscilloscope (30MHz or higher)	<p>(Ex. 1)</p>  <p>Fig. 19</p> <p>(EX. 2)</p>  <p>Fig. 20</p>

• Adjustment Steps

- Play forward the DCC Test tape (RFKZ0032).
- Adjust potentiometer R135 so the voltage at J103-pin ⑦ is $1.2V_{p-p} \pm 100mV$ (Fig. 19).
(or RD MUX on the B SIDE of the PASC DIGITAL P.C.B. will do (Fig. 20).)



4. ANALOG OUTPUT LEVEL ADJUSTMENT (READ/WRITE P.C.B.)

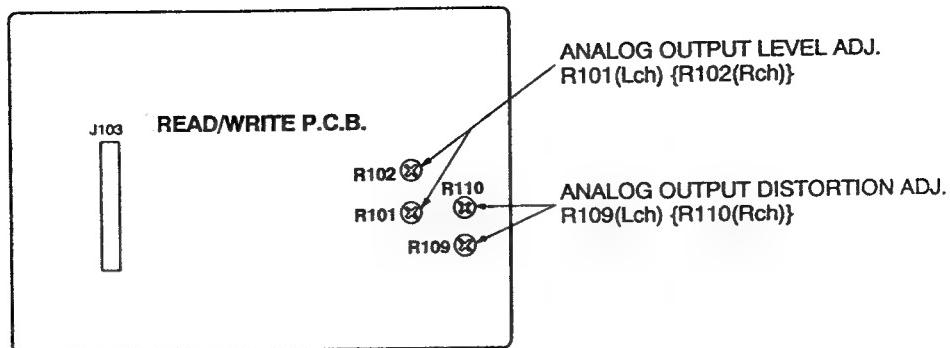


Fig. 22

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Test tape (QZZCFM) 2. Screwdriver (-)	1. Oscilloscope (30MHz or higher) 2. EVM (AC Range)	<p>FIX OUT (ANALOG) RS-DC10</p>

Fig. 23

- Adjustment Steps

- (1) Play forward the 315Hz, 0dB test tone on the ACC Test tape (QZZCFM).
- (2) Maximize output level with potentiometers R101 (Lch) and R102 (Rch).
- (3) Reduce output level by -10dB (optimum output level) from the maximum level again with R101 and R102.

5. CONFIRMATION OF ANALOG OUTPUT DISTORTION ADJUSTMENT (READ/WRITE P.C.B.)

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Test tape (QZZCFM) 2. Screwdriver (-)	1. Oscilloscope (30MHz or faster) 2. Distortion Factor Meter	<p>FIX OUT (ANALOG) RS-DC10</p>

Fig. 24

- Adjustment Steps

- (1) Play forward the 315Hz, 0dB test tone on the ACC Test tape (QZZCFM).
- (2) Check to make sure that THD is no greater than 1.5%.
- (3) If THD is grater than 1.5%, adjust the R109 (Lch) and R110 (Rch) until it is within 1.5%.

ADJUSTMENT POINTS (MAIN P.C.B.)

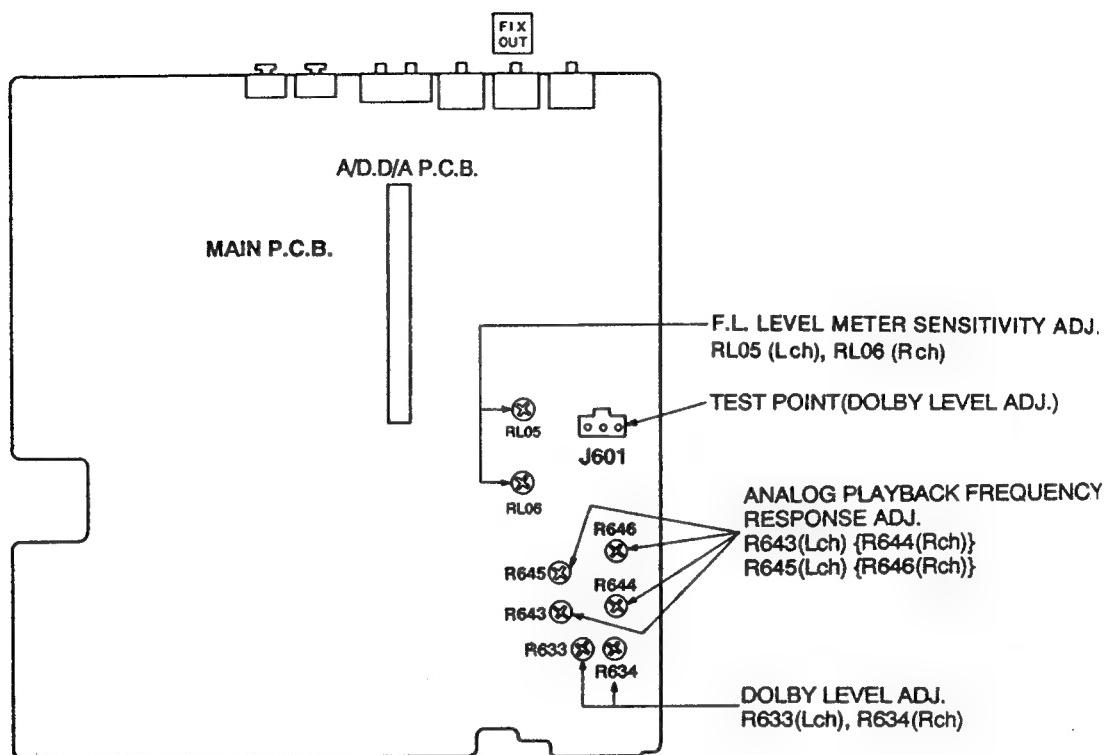


Fig. 25

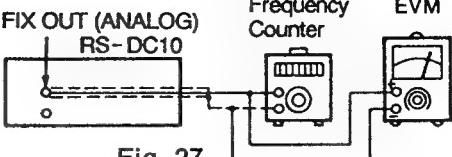
6. DOLBY LEVEL ADJUSTMENT (MAIN P.C.B.)

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. Dolby level tape (RFKZ0038)	1. EVM (AC Range)	<p>Fig. 26</p>

• Adjustment Steps

- (1) While playing back the Dolby level tape (RFKZ0038), adjust the voltage at test point J601 to 338mV using R633 (Lch) and R634 (Rch) (See Fig. 25).

7. ANALOG PLAYBACK FREQUENCY RESPONSE ADJUSTMENT (MAIN P.C.B.)

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Test tape (QZZCFM) 2. Screwdriver (-)	1. Frequency Counter 2. EVM (AC Range)	 <p>Fig. 27</p>

• Adjustment Steps

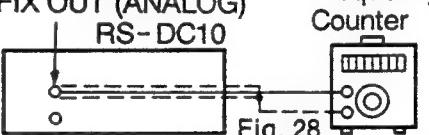
- (1) Play the 1kHz and 63Hz test tones on the ACC Test tape (QZZCFM) and adjust potentiometers R645 (Lch) and R646 (Rch) until the FIXED OUT output level at 63Hz is within $0 \pm 0/-1\text{dB}$ from that at 1kHz.
- (2) Play the 1kHz and 12.5kHz test tones on the ACC Test tape (QZZCFM) and adjust potentiometers R643 (Lch) and R644 (Rch) until the FIXED OUT output level at 12.5kHz is within $0 \pm 0/-1\text{dB}$ from at 1kHz.

(See Fig. 25)

Notes:

- During adjustment, monitor playback frequency with a Frequency Counter.
- Misalignment will affect the ACC Test tape (QZZCFM) playback frequency response.

8. TAPE SPEED ADJUSTMENT (TRAY P.C.B.)

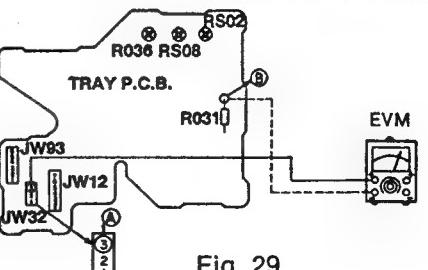
Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Test tape (QZZCFM) 2. Screwdriver (-)	1. Frequency Counter	 <p>Fig. 28</p>

• Adjustment Steps

- (1) Play forward the 3000Hz test tone on the ACC Test tape (QZZCFM) and adjust the signal frequency at the FIXED OUT jack to $3000\text{Hz} \pm 10\text{Hz}$ with potentiometer RS02 (See Fig. 29).
- (2) Play backward the 3000Hz test tone on the ACC Test tape (QZZCFM) and adjust the signal frequency at the FIXED OUT jack to $3000\text{Hz} \pm 10\text{Hz}$ with potentiometer RS08 (See Fig. 29).

9. QUICK REVERSE SENSOR ADJUSTMENT (TRAY P.C.B.)

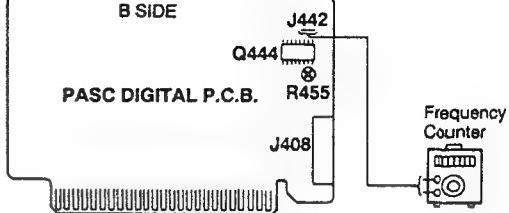
- The purpose of this adjustment is to set EOT sensor's sensitivity to the magnetic and leader portions of cassette tapes (quick reverse sensor).

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Blank tape (MAXELL UD-I90) (commercially available) 2. Screwdriver (-)	1. EVM (DC Range)	 <p>Fig. 29</p>

• Adjustment Steps

- (1) Play the leader tape portion of an ACC Blank tape (MAXELL UD-I90) and adjust the potential difference between JW32 and R031 to 1V with potentiometer R036.

10. PLL ADJUSTMENT (PASC DIGITAL P.C.B.)

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. Screwdriver (-)	1. Frequency Counter	 <p>Fig. 30</p>

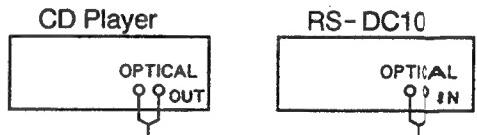
• Adjustment Steps

- (1) Place the unit in STOP mode.
- (2) Adjust VCO free-running frequency (J442) to $7.5\text{MHz} \pm 0.1\text{MHz}$ with potentiometer R455.

Note:

- Misalignment can cause digital signal drop-out.
- Perform measurements with the digital source input (optical, coaxial) disconnected.
- Do not use the Extension cable (RFKZ0031), since the influence of external noise may cause incorrect results. Adjust again after putting the PASC and the P.C.B. back in their original positions.

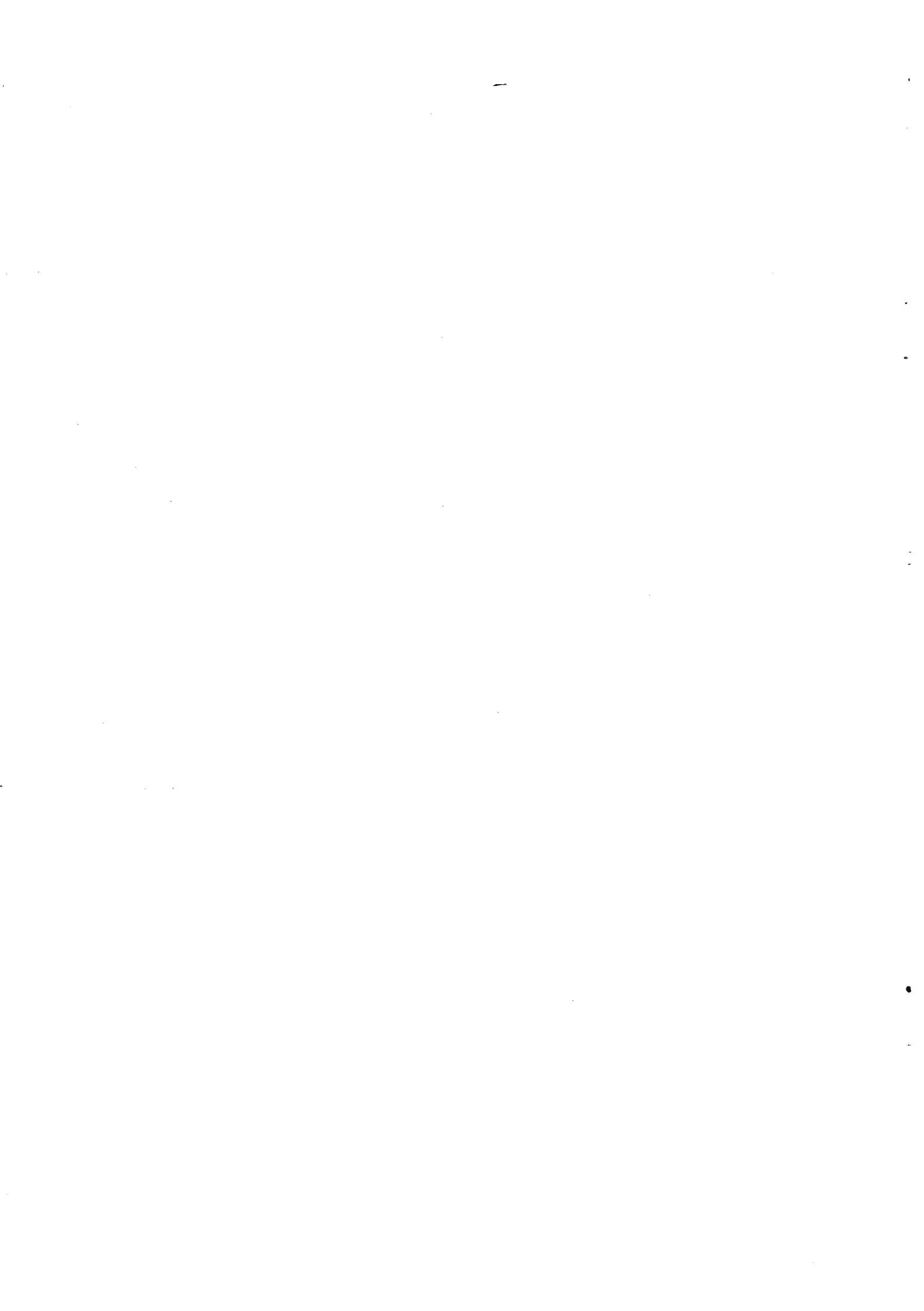
11. F.L. LEVEL METER SENSITIVITY ADJUSTMENT (MAIN P.C.B.)

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. CD player (with optical output) 2. CD Test disc (SZZP1054C) 3. DCC Blank tape (RFKZ0033)	1. Nothing	 <p>Fig. 31</p>

• Adjustment Steps

- (1) Load a DCC Blank tape (RFKZ0033) in the unit under test and place it in REC PAUSE mode.
- (2) Load the CD Test disc (SZZP1054C) in the CD player and play the second band (1kHz, 0dB, L+R signal).
- (3) Adjust potentiometers RL05 (Lch) and RL06 (Rch) so the DCC unit's FL level meters indicate 0 to -2dB (See Fig. 25).

Other potentiometers (R117 on Read/Write P.C.B. or R633, R634 on Main P.C.B.) require no service adjustment.



Service Manual

Digital Compact Cassette Deck

RS-DC10**Supplement-1**

Please file and use this supplement manual together with the service manual for Model No. RS-DC10, Order No. AD9209339C1 (PP), AD9209340C8 (EB, EG, G).

Note: This supplement is intended to provide additional information or corrections to the existing service manual for Model No. RS-DC10. Be sure to update your service manual for future reference.

Colour

(K) ... Black Type

Area

Suffix for Model No.	Area	Colour
(PP)	U.S.A./Canada.	(K)
(EB)	Great Britain.	
(EG)	Germany, Italy and Europe.	
(G)	Asia, Latin America, Middle Near East and Africa.	

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NOTE : Please put this Supplement-1 (AD9307210S0) in the place of Supplement (AD9212389C8).

Technics

■ CAUTION!

- 1** Connect a wrist strap (RFKZ0036) to the meter's ground terminal. Always wear a wrist strap when replacing the heads or inspecting or repairing a P.C.B. to prevent electrostatic breakdown.

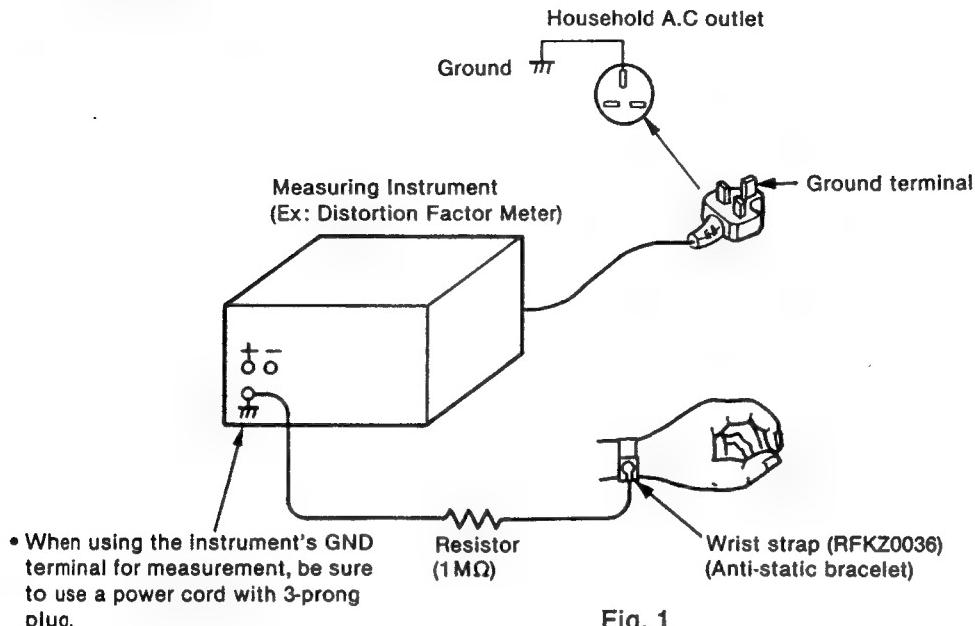


Fig. 1

- 2** When removing the head FPC from the READ/WRITE P.C.B., always attach a shorting clip to the FPC to prevent electrostatic breakdown.

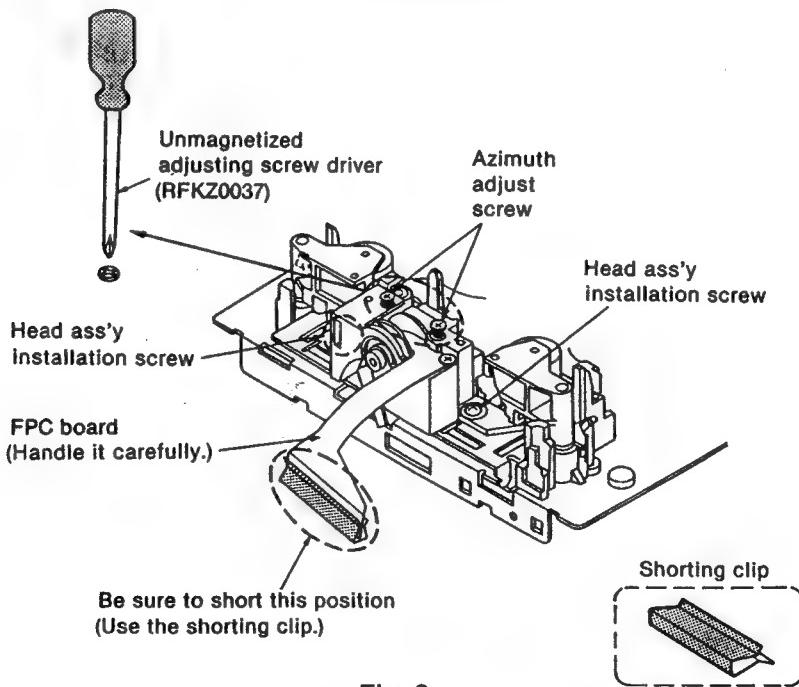


Fig. 2

- 3** Use the unmagnetized adjusting screw driver (RFKZ0037) for replacing the head and for AZTEC adjustment.
(The head may be damaged by an external magnetic field.)

■ PREPARATION FOR ADJUSTMENTS

- How to use Extension cables (RFKZ0029, RFKZ0030, RFKZ0031) for Adjustment

Extension cable	P.C.B. to P.C.B.
RFKZ0029	Main P.C.B. ↔ Mechanism Block (JW02/05/06) (See Fig. 3)
RFKZ0030	PASC P.C.B. ↔ Read/Write P.C.B. (See Fig. 4)
RFKZ0031	Main P.C.B. ↔ PASC Digital P.C.B. (See Fig. 4)

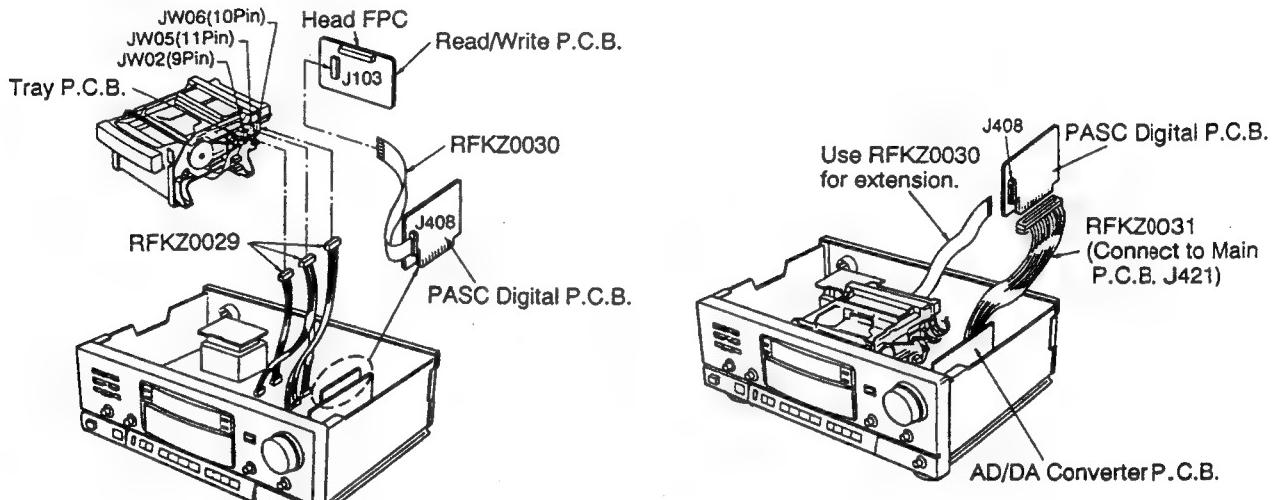


Fig. 3

Fig. 4

- Necessary Test tapes for each adjustment

Part No.	Name	Use
QZZCAC	10kHz Test tape	AZTEC adjustment
QZZCRD	Mirror tape	
RFKZ0033	DCC Blank tape	Optimum DCC recording current adjustment
DCC-S1	DCC Characteristics tape	DCC playback level adjustment and Error Rate check
QZZCFM	ACC Test tape	Analog feedback adjustment Minimum analog output distortion adjustment Analog output frequency response characteristics adjustment
RFKZ0038	Dolby level tape	Dolby level adjustment
QZZCWAT	3kHz Test tape	Tape speed adjustment

- Necessary tools and measuring instruments

Tools

Unmagnetized adjusting screw driver (RFKZ0037)
CD player (EX: SL-PS700, SL-PS900 etc.)

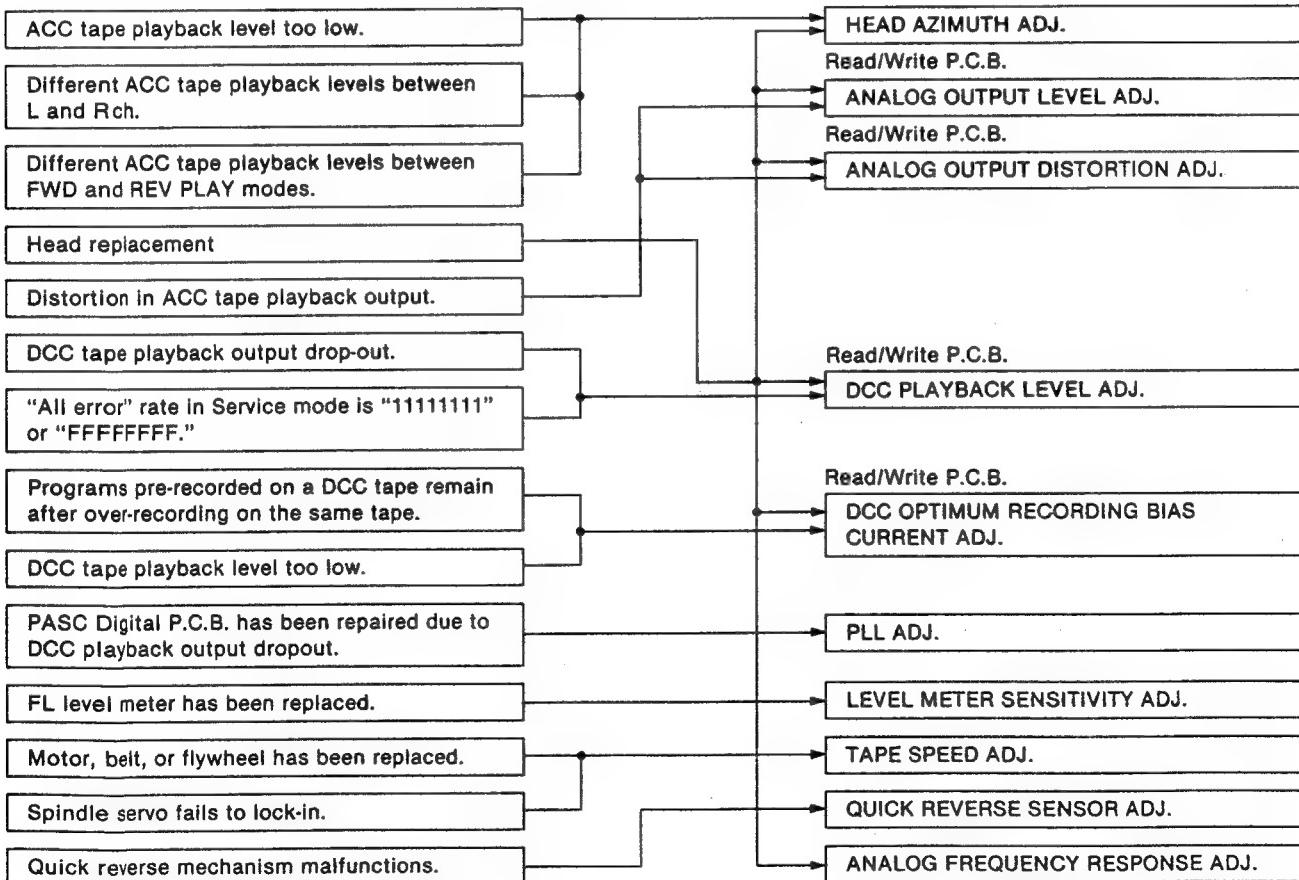
Measuring Instruments

Oscilloscope (30 MHz or Higher)
Distortion Factor Meter
Frequency Counter
Electric Volt Meter (AC/DC)

■ EXAMPLES OF PROBLEMS WHICH REQUIRE ADJUSTMENT

Problem or Repair Requiring Adjustment

Adjustment Item



■ WHAT YOU SHOULD KNOW BEFORE ADJUSTMENT

The DCC head block employs the AZTEC mechanism. AZTEC plays an important role in stabilizing the running of the tape relative to the head.

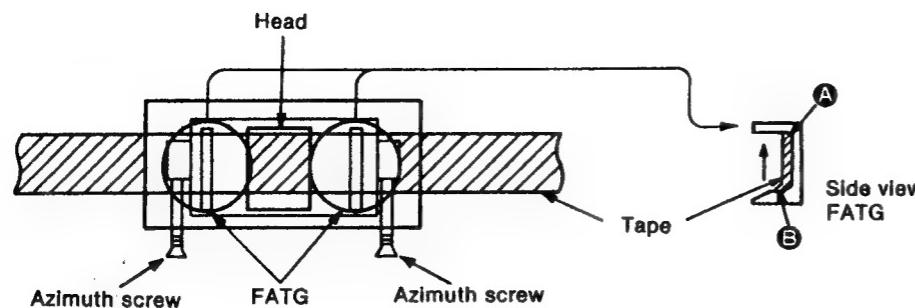


Fig. 1

The Fixed Azimuth Tape Guidance (FATG) has a different shape above and below the tape. The upper part **A** is the guiding surface for the tape's upper edge. The slanted area of the lower part **B** is structured so that the tape moves itself upwards. The tape usually runs along the upper guiding surface **A**.

When the head has been replaced, be sure to adjust the AZTEC.

① Head is too low relative to the tape hub.

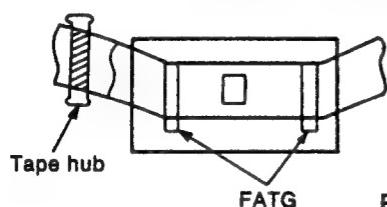
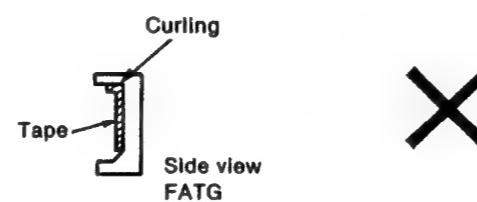


Fig. 2



② Head and tape hub are correctly aligned.

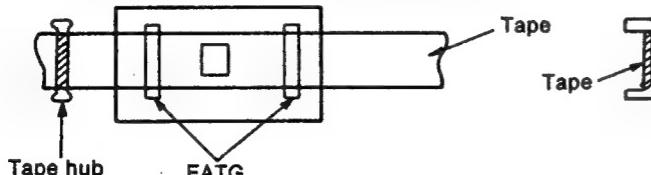


Fig. 3



③ Head is too high relative to the tape hub.

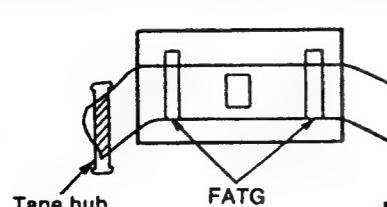


Fig. 4



* If condition ① or ③ occurs, adjust the azimuth screws to obtain the correct position (as shown in ②).

• Front Panel

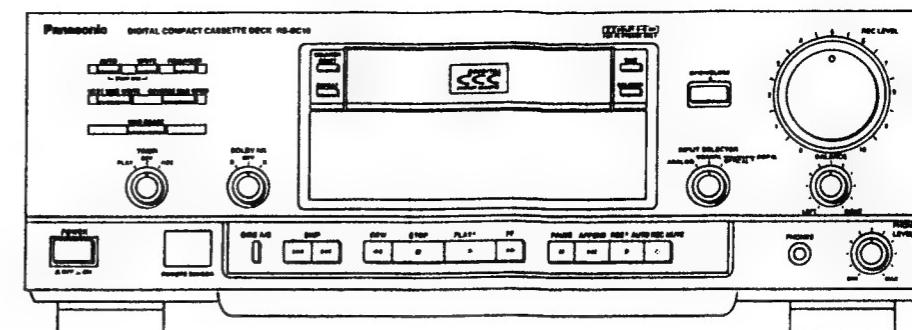


Fig. 5

• Rear Panel

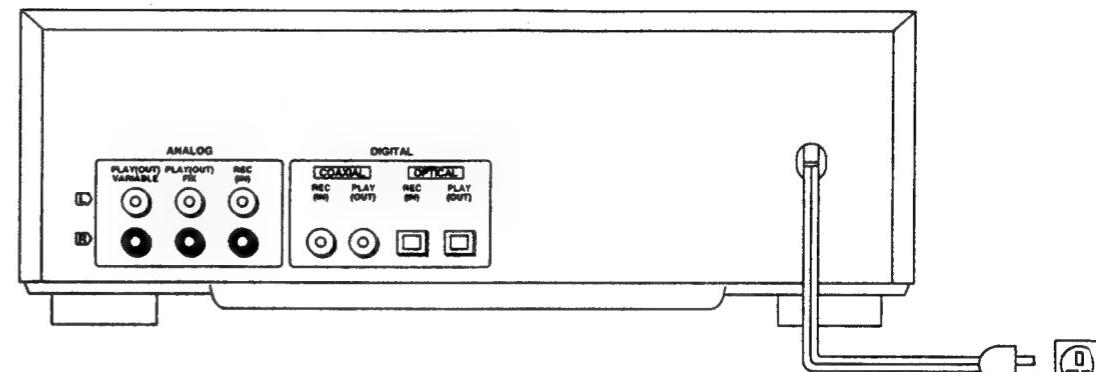
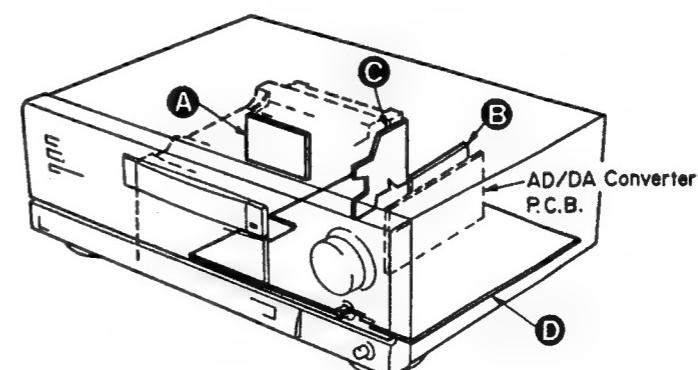


Fig. 6

• P.C.B. Location

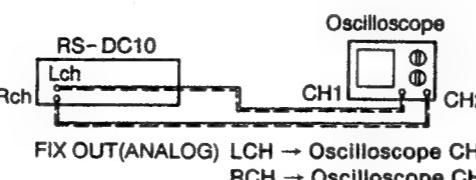


- Ⓐ READ/WRITE P.C.B.
- Ⓑ PASC DIGITAL P.C.B.
- Ⓒ TRAY P.C.B.
- Ⓓ MAIN P.C.B.

Fig. 7

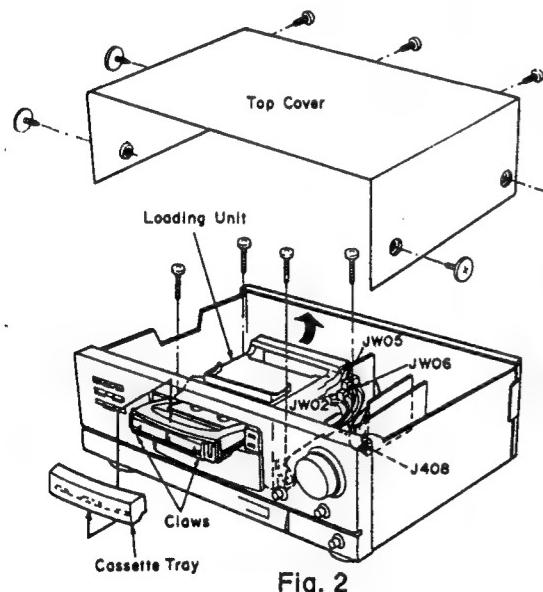
■ ADJUSTMENT

1. AZTEC ADJUSTMENT

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. Mirror tape (QZZCRD) 2. 10kHz Test tape (QZZCAC) 3. Unmagnetized adjusting screw driver (RFKZ0037) 4. Wrist strap (RFKZ0036)	1. Oscilloscope (30MHz or higher)	 <p>Fig. 1</p>

• Adjustment Steps

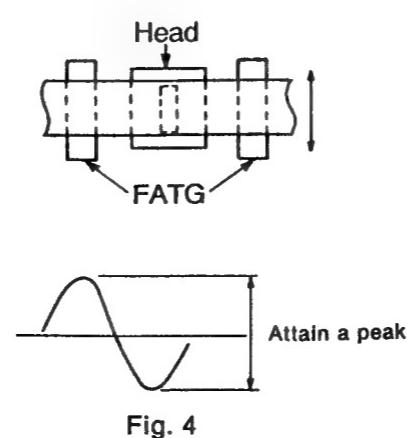
- (1) Trigger on CH1.
- (2) Remove the tape control lever from the tray mechanism.



• Rough Adjustment

STEP 1

1. Using the Mirror tape (QZZCRD):
Adjust the Azimuth screws so that the Mirror tape (QZZCRD) runs over the center of the head.
2. Not using the Mirror tape (QZZCRD):
While playing back the 10kHz Test tape (QZZCAC), adjust the Azimuth screws to attain a peak on one channel (RCH) only.

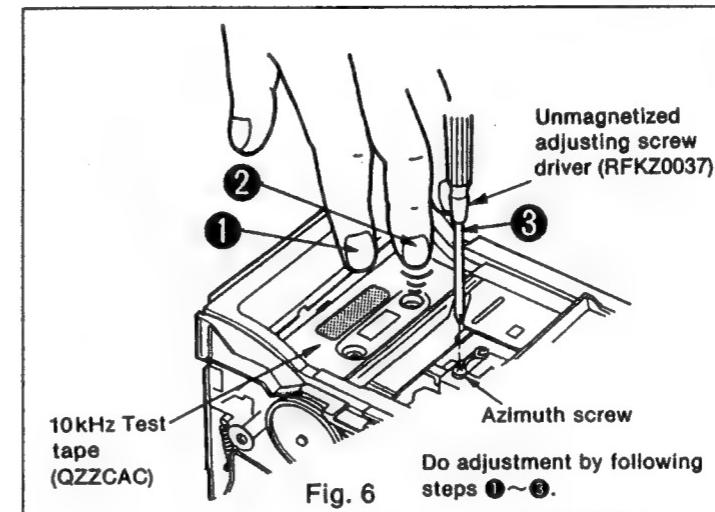


• Fine Adjustment

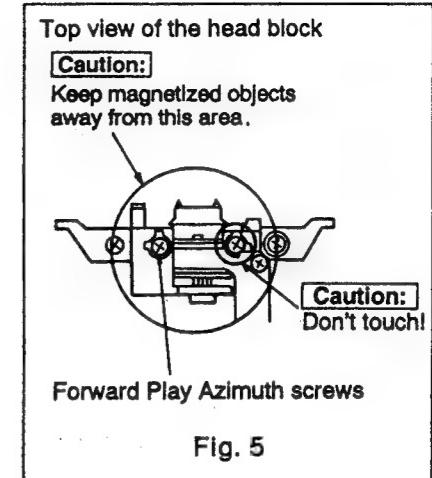
STEP 2 Forward side adjustment

To adjust in the forward direction, use the right side Azimuth screw.
Do not touch the left side Azimuth screw (Fig. 5).

1. Run the 10kHz Test tape (QZZCAC) to its middle. Press a finger on the shaded area (●) and run the tape. (To keep the cassette from floating.)
2. While keeping your finger in the position given in Fig. 6. Press another finger on the head of the Supply reel cap, and turn the right side Azimuth screw to the right. (Control the range of movement to the left and right of the CH1 waveform.)



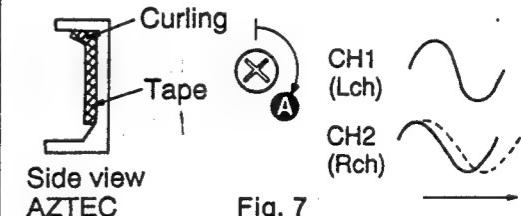
• Adjustment Points



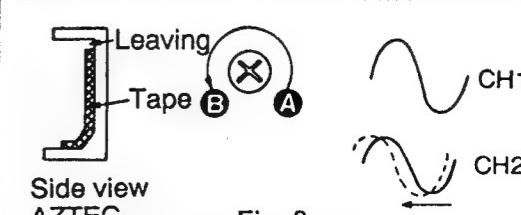
Procedure

Reference figure

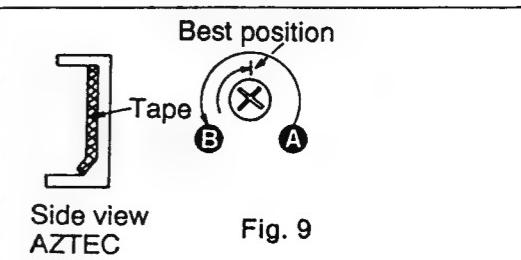
- ① Stop the right side Azimuth screw at the point where only the CH2 waveform starts to move **A**.



- ② Turn the Azimuth screw to the left until the point where the waveform starts to move in the opposite direction **B**.



- ③ Turn the Azimuth screw to halfway between **A** and **B**.



STEP 3 Method of verification

1. Connect the oscilloscope to the AZCHK terminal of the PASC DIGITAL P.C.B. (Fig. 11).
2. Playback the DCC Characteristics tape (DCC-S1).
If the pulse width shown is within 150μsec, the adjustment is good (Fig. 10).
3. Otherwise, re-adjust starting with **STEP 1** (Refer to page 7).

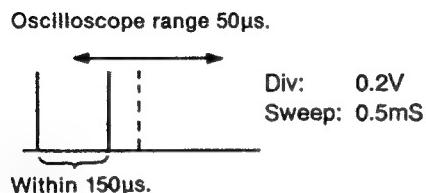


Fig. 10

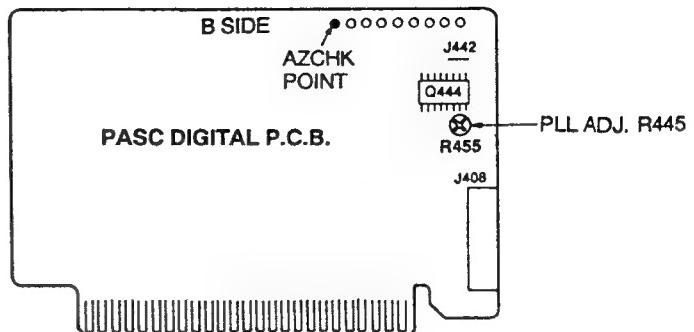


Fig. 11

STEP 4 Reverse side adjustment

To adjust in the reverse direction, use the left side Azimuth screw.
Do not touch the right side Azimuth screw (Fig. 12).

1. Reverse playback the 10kHz Test tape (QZZCAC).
(Control the tape with your finger.)
2. While reverse playing and keeping your finger pressed on the Supply reel cap (to apply a load), turn the left side Azimuth screw as was done for the forward side adjustment (Fig. 13).

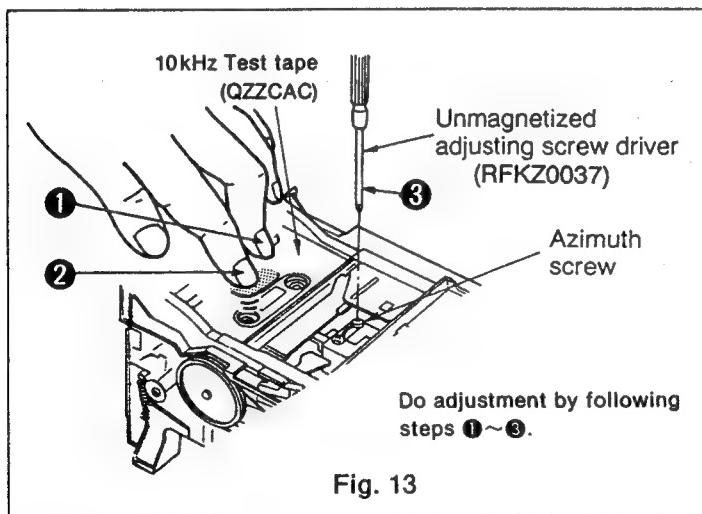


Fig. 13

• Adjustment Points

Top view of the head block

Caution:
Keep magnetized objects away from this area.

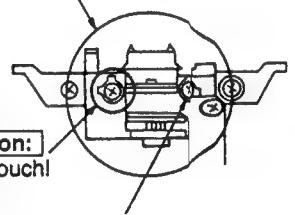
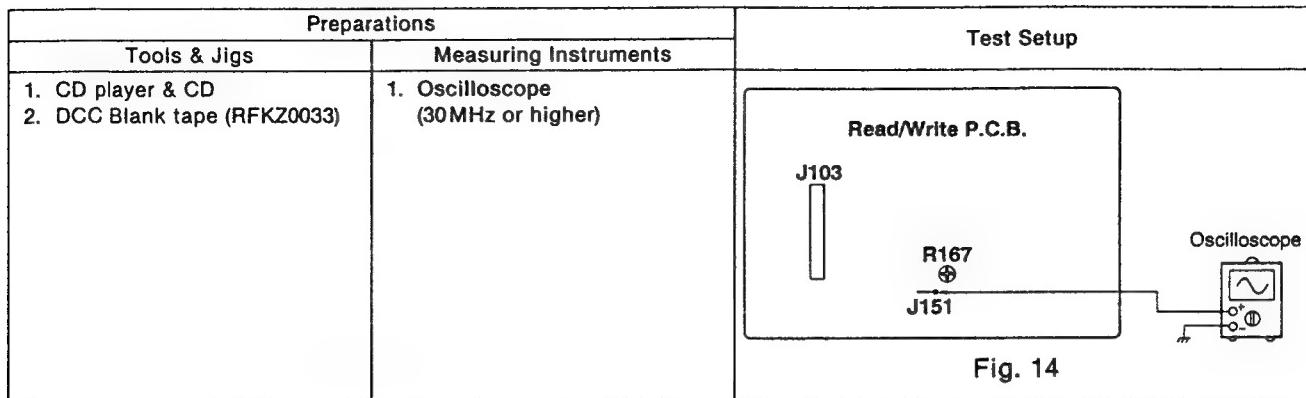


Fig. 12

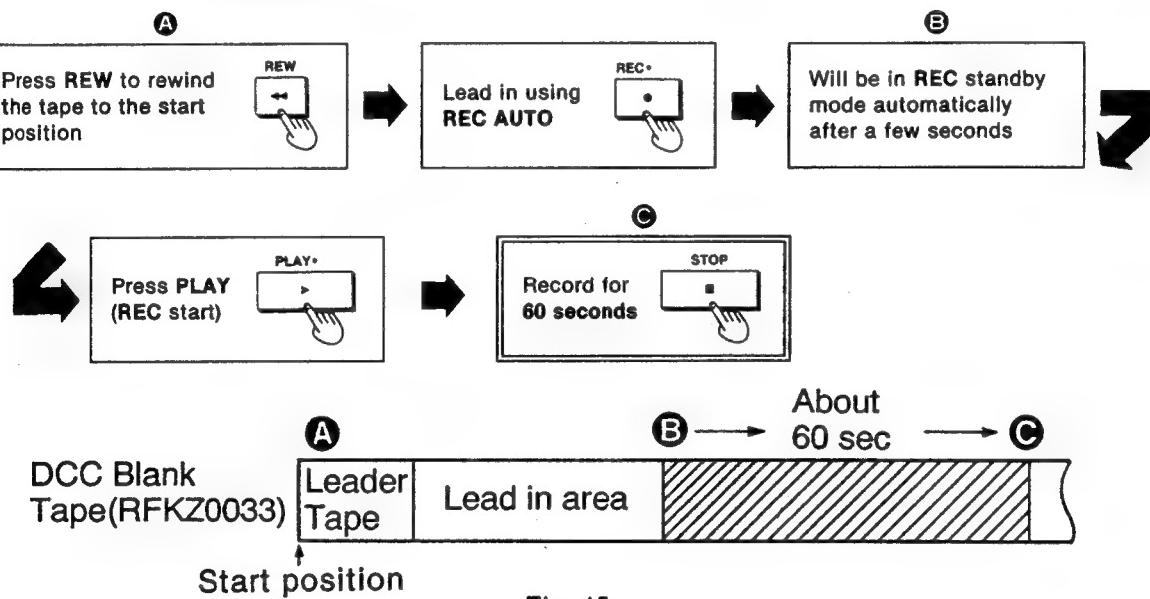
3. The method of verification is also the same.

2. OPTIMUM DCC RECORDING CURRENT ADJUSTMENT (READ/WRITE P.C.B.)

- Connect the CD player output terminal with the DCC recording terminal (either analog input, digital input, or optical input). Record the CD sound onto the DCC Blank tape (RFKZ0033). This recording gives A-time.



[How to do A-time recording]



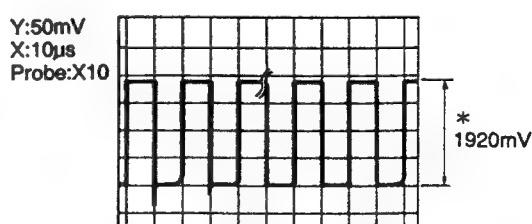
• Adjustment Steps

- Put the unit in REC mode using an unrecorded section of the DCC Blank tape (RFKZ0033).
- Adjust potentiometer R167 to obtain the optimum voltage on the output level of J151.

* How to find the optimum voltage

The bias current indicated on the back of the FPC of each head is found using the following formula:

$$V = I \times R_{151} (12\Omega)$$

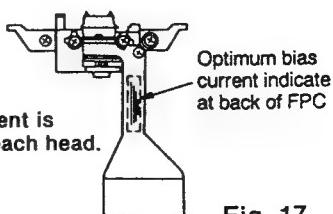


Example:

When the bias current is 160mA:

$$V = 160\text{mA} \times 12\Omega = 1920\text{mV}$$

The bias current is different for each head.



(I) Method of Verification (Must be performed after adjustment.)

Overwrite with another music source part of the section that was recorded during preparation.

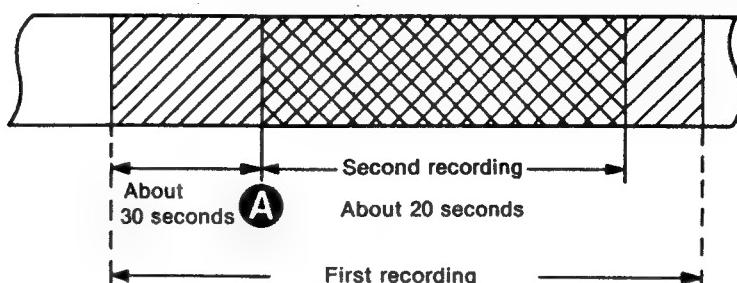
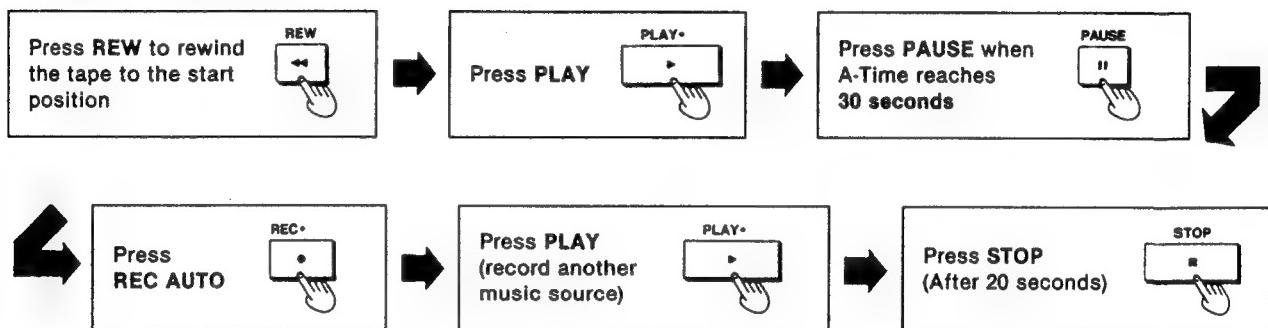


Fig. 18

[How to overwrite]



(II) Verification Items

Rewind the tape and play it back, and check the following at the breaks between tracks.

1. Check that A-Time is played back.
(Fails if the recording current is low.)
2. Check the Error Rate
 - ① Stop after about 25 seconds from the tape start position.
 - ② Turn off the power so that "ALL • ERR • RATE" is displayed in the service mode, and play the tape again. (Refer to page 12)
 - ③ Confirm that "00 0000000" remains on the display, although the Error Rate is momentarily worse than this at A-Time (5 seconds after the initial 25 seconds).

(III) Viewing the "Error Rate"**(1) Setting the Error Rate mode**

1. Turn the POWER off. While pressing both the STOP key and the PLAY key, turn the POWER on.
2. [SERVICE MODE] is displayed.

```
! ' + ' + - , / 0 1 2 3 4 5 6 7 8 9
< = > 7 A B C D E F G H I J K L M N
O P Q R S T U V W X Y Z
```

are scrolled in order.

Press the COUNTER key on the DCC seven times.
ALL • ERR • RATE is displayed.

Place a pre-recorded tape into the machine and press the PLAY key.

3. Ten characters (numbers or letters) will be displayed on the display section.
This display shows the Error Rate on each of 8 CH signal tracks and the AUX CH.
The signal drop-out condition for each channel is displayed using the hexadecimal digits 0-9, A-F.

```
Aux CH   CH 1 2 3 4 5 6 7 8
00       0 0 0 0 0 0 0 0
|
9
A
|
F F F F F F F F
```

(2) Error Rate acceptability criteria

Display	Condition
"00000000" is constantly displayed for all tracks.	Normal (OK)
"01101000" is momentarily displayed for any one to three tracks (or more).	Normal (OK)
"11111111" is constantly displayed for one to three tracks (or more). Anything but "0" is displayed.	Error
"11111111" is constantly displayed for all tracks. Anything but "0" is displayed.	Error
"FFFFFFF" is constantly displayed for all tracks.	Error

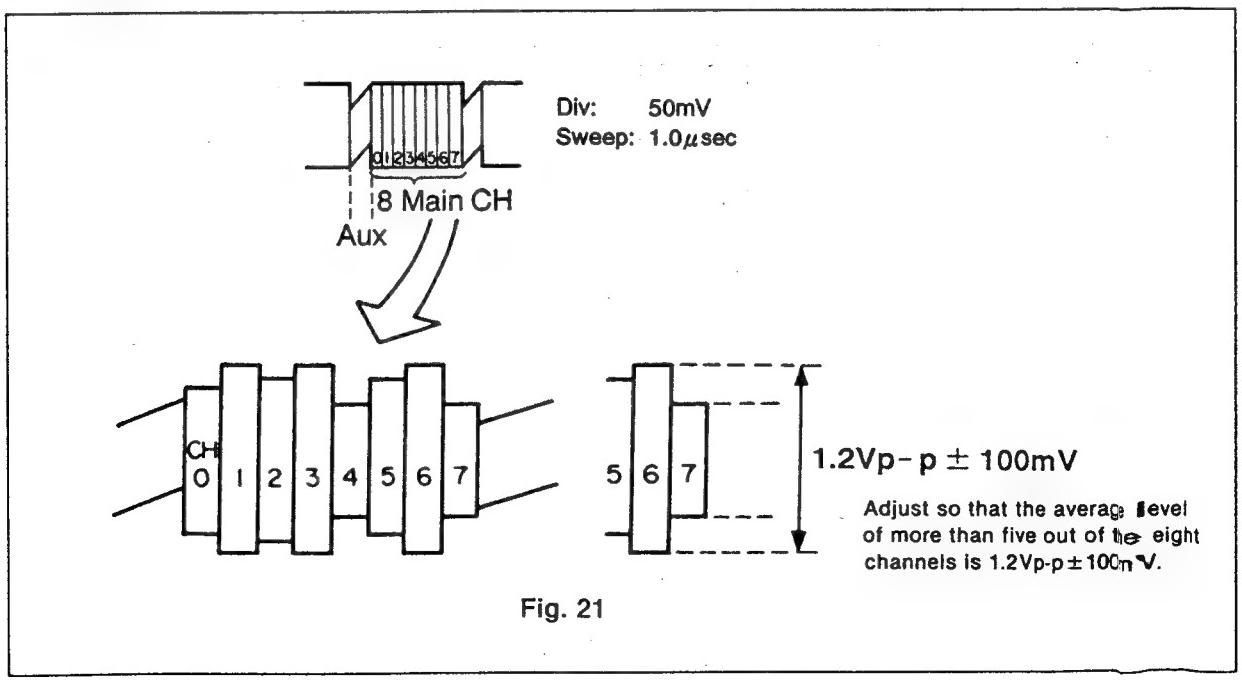
3. DCC PLAYBACK LEVEL ADJUSTMENT (READ/WRITE P.C.B. or PASC DIGITAL P.C.B.)

- The purpose of this adjustment is to feed digital signals at the specified level from the DCC RF circuit to the PASC Digital circuit.

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. DCC Test tape (DCC-S1). 2. Screwdriver (-)	1. Oscilloscope (30MHz or higher)	<p>(Ex. 1)</p> <p>Fig. 19</p> <p>(Ex. 2)</p> <p>Fig. 20</p>

• Adjustment Steps

- Play forward the DCC Test tape (DCC-S1).
- Adjust potentiometer R135 so the voltage at J103-pin ⑦ is $1.2V_{p-p} \pm 100mV$ (Fig. 19).
(or RD MUX on the B SIDE of the PASC DIGITAL P.C.B. will do (Fig. 20).)



4. ANALOG OUTPUT LEVEL ADJUSTMENT (READ/WRITE P.C.B.)

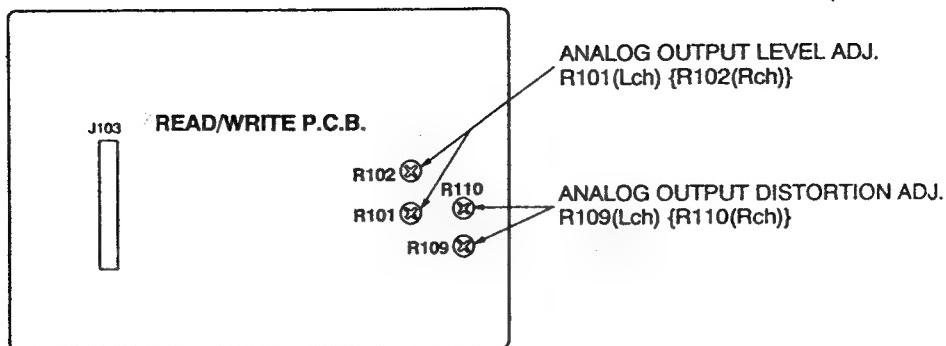


Fig. 22

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Test tape (QZZCFM) 2. Screwdriver (-)	1. Oscilloscope (30 MHz or higher) 2. EVM (AC Range)	<p>FIX OUT (ANALOG) RS-DC10 connected to an EVM (AC Range) which is then connected to an Oscilloscope. The EVM is also connected to ground.</p>

Fig. 23

• Adjustment Steps

- (1) Play forward the 315Hz, 0dB test tone on the ACC Test tape (QZZCFM).
- (2) Maximize output level with potentiometers R101 (Lch) and R102.
- (3) Reduce output level by -10dB (optimum output level) from the maximum level again with R101 and R102.

5. CONFIRMATION OF ANALOG OUTPUT DISTORTION ADJUSTMENT (READ/WRITE P.C.B.)

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Test tape (QZZCFM) 2. Screwdriver (-)	1. Oscilloscope (30 MHz or faster) 2. Distortion Factor Meter	<p>FIX OUT (ANALOG) RS-DC10 connected to a Distortion Factor Meter, which is then connected to an Oscilloscope. The Distortion Factor Meter is also connected to ground.</p>

Fig. 24

• Adjustment Steps

- (1) Play forward the 315Hz, 0dB test tone on the ACC Test tape (QZZCFM).
- (2) Check to make sure that THD is no greater than 1.5%.
- (3) If THD is grater than 1.5%, adjust the R109 (Lch) and R110 (Rch) until it is within 1.5%.

ADJUSTMENT POINTS (MAIN P.C.B.)

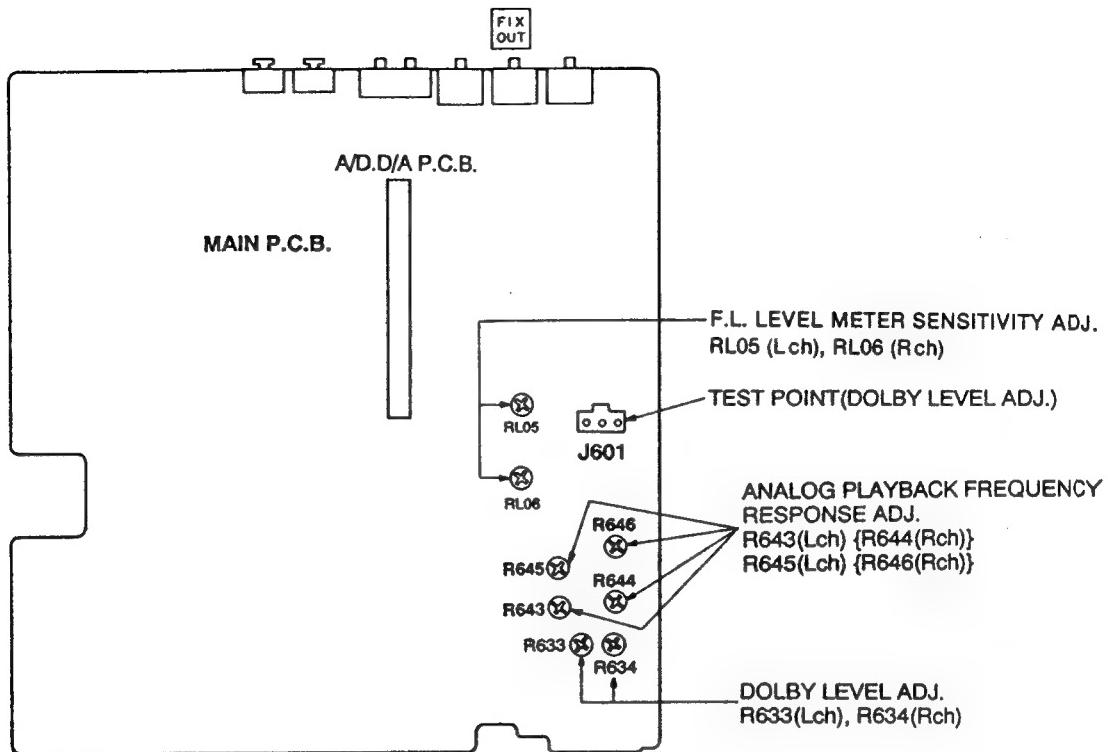


Fig. 25

6. DOLBY LEVEL ADJUSTMENT (MAIN P.C.B.)

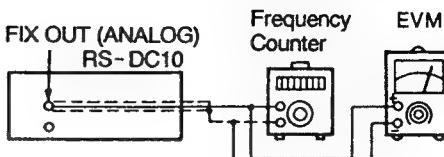
Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. Dolby level tape (RFKZ0038)	1. EVM (AC Range)	<p>J601 Main P.C.B.</p> <p>EVM</p>

Fig. 26

• Adjustment Steps

- (1) While playing back the Dolby level tape (RFKZ0038), adjust the voltage at test point J601 to 33mV using R633 (Lch) and R634 (Rch) (See Fig. 25).

7. ANALOG PLAYBACK FREQUENCY RESPONSE ADJUSTMENT (MAIN P.C.B.)

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Test tape (QZZCFM) 2. Screwdriver (-)	1. Frequency Counter 2. EVM (AC Range)	 <p>Fig. 27</p>

• Adjustment Steps

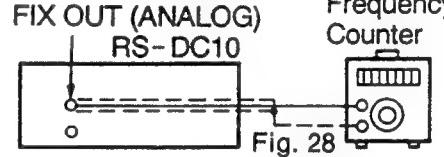
- (1) Play the 1kHz and 63Hz test tones on the ACC Test tape (QZZCFM) and adjust potentiometers R645 (Lch) and R646 (Rch) until the FIXED OUT output level at 63Hz is within $0 \pm 0/-1$ dB from that at 1kHz.
- (2) Play the 1kHz and 12.5kHz test tones on the ACC Test tape (QZZCFM) and adjust potentiometers R643 (Lch) and R644 (Rch) until the FIXED OUT output level at 12.5kHz is within $0 \pm 0/-1$ dB from at 1kHz.

(See Fig. 25)

Notes:

- During adjustment, monitor playback frequency with a Frequency Counter.
- Misalignment will affect the ACC Test tape (QZZCFM) playback frequency response.

8. TAPE SPEED ADJUSTMENT (TRAY P.C.B.)

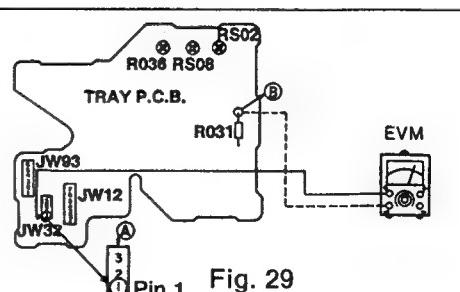
Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Test tape (QZZCWAT). 3kHz - 10dB 2. Screwdriver (-)	1. Frequency Counter	 <p>Fig. 28</p>

• Adjustment Steps

- (1) Play forward the 3000Hz test tone on the ACC Test tape (QZZCWAT) and adjust the signal frequency at the FIXED OUT jack to $3000\text{Hz} \pm 10\text{Hz}$ with potentiometer RS02 (See Fig. 29).
- (2) Play backward the 3000Hz test tone on the ACC Test tape (QZZCWAT) and adjust the signal frequency at the FIXED OUT jack to $3000\text{Hz} \pm 10\text{Hz}$ with potentiometer RS08 (See Fig. 29).

9. QUICK REVERSE SENSOR ADJUSTMENT (TRAY P.C.B.)

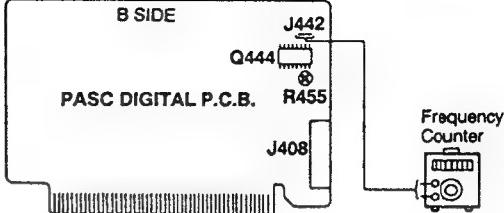
- The purpose of this adjustment is to set EOT sensor's sensitivity to the magnetic and leader portions of cassette tapes (quick reverse sensor).

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Blank tape (MAXELL UD-I90) (commercially available) 2. Screwdriver (-)	1. EVM (DC Range)	 <p>Fig. 29</p>

• Adjustment Steps

- (1) Play the leader tape portion of an ACC Blank tape (MAXELL UD-I90) and adjust the potential difference between JW32 and R031 to 1V with potentiometer R036.

10. PLL ADJUSTMENT (PASC DIGITAL P.C.B.)

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. Screwdriver (-)	1. Frequency Counter	 <p>Fig. 30</p>

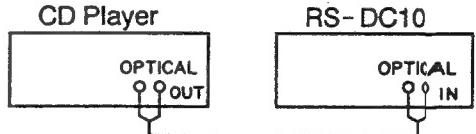
• Adjustment Steps

- (1) Place the unit in STOP mode.
- (2) Adjust VCO free-running frequency (J442) to $7.5\text{MHz} \pm 0.1\text{MHz}$ with potentiometer R455.

Note:

- Misalignment can cause digital signal drop-out.
- Perform measurements with the digital source input (optical, coaxial) disconnected.
- Do not use the Extension cable (RFKZ0031), since the influence of external noise may cause incorrect results. Adjust again after putting the PASC and the P.C.B. back in their original positions.

11. F.L. LEVEL METER SENSITIVITY ADJUSTMENT (MAIN P.C.B.)

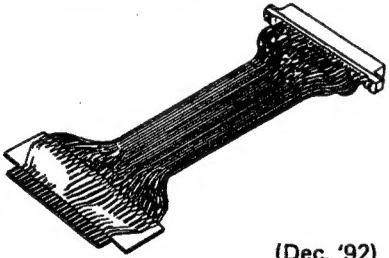
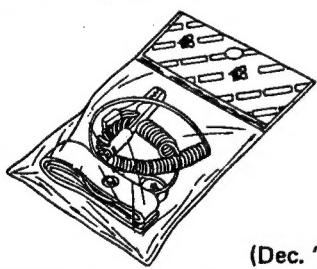
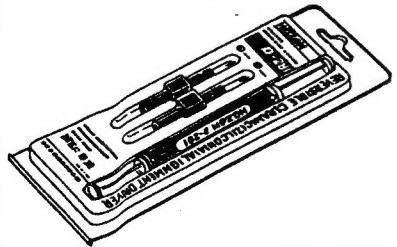
Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. CD player (with optical output) 2. CD Test disc (SZZP1054C) 3. DCC Blank tape (RFKZ0033)	1. Nothing	 <p>Fig. 31</p>

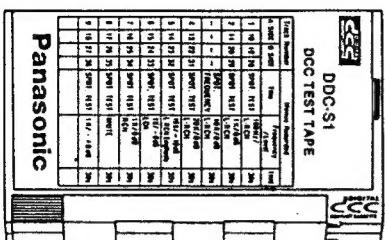
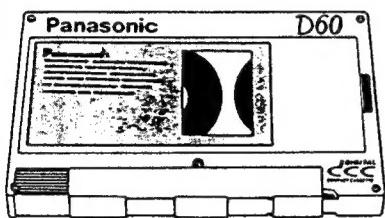
• Adjustment Steps

- (1) Load a DCC Blank tape (RFKZ0033) in the unit under test and place it in REC PAUSE mode.
- (2) Load the CD Test disc (SZZP1054C) in the CD player and play the second band (1kHz, 0dB, L+R signal).
- (3) Adjust potentiometers RL05 (Lch) and RL06 (Rch) so the DCC unit's FL level meters indicate 0 to -2dB (See Fig. 25).

Other potentiometers (R117 on Read/Write P.C.B. or R633, R634 on Main P.C.B.) require no service adjustment.

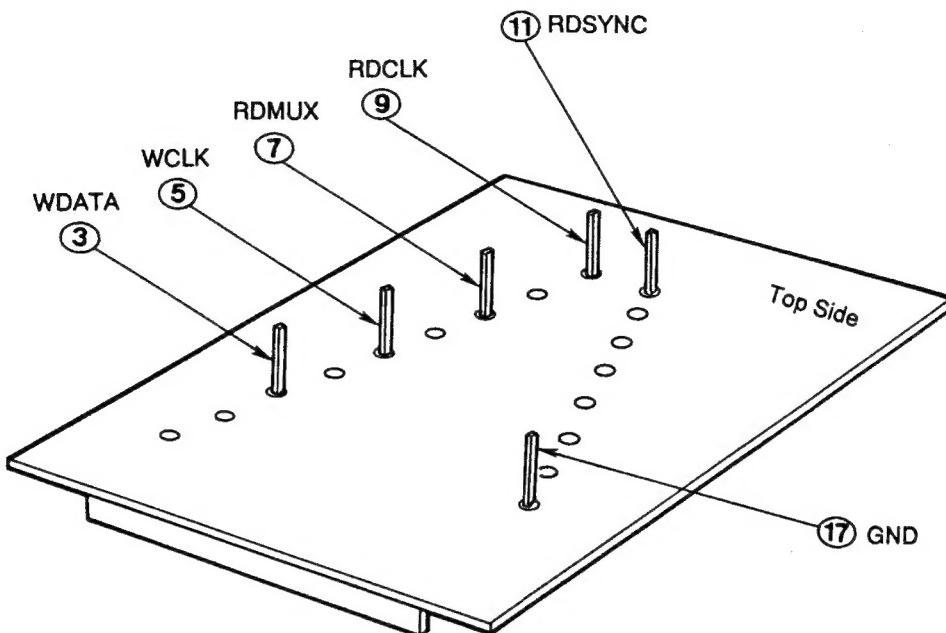
12. DCC TEST FIXTURE LIST

Appearance	Part No.	Description
Extension Cable  (Dec. '92)	RFKZ0029	Used for checking Tray P.C.B.
Extension FPC  (Dec. '92)	RFKZ0030	Used for checking Read/Write P.C.B.
Extension Cable  (Dec. '92)	RFKZ0031	Used for checking Pasc P.C.B.
Wrist strap (F-50)  (Dec. '92)	RFKZ0036	Discharge static electricity from body
Screw Driver (D-281)  (Dec. '92)	RFKZ0037	Head Azimuth adjustment

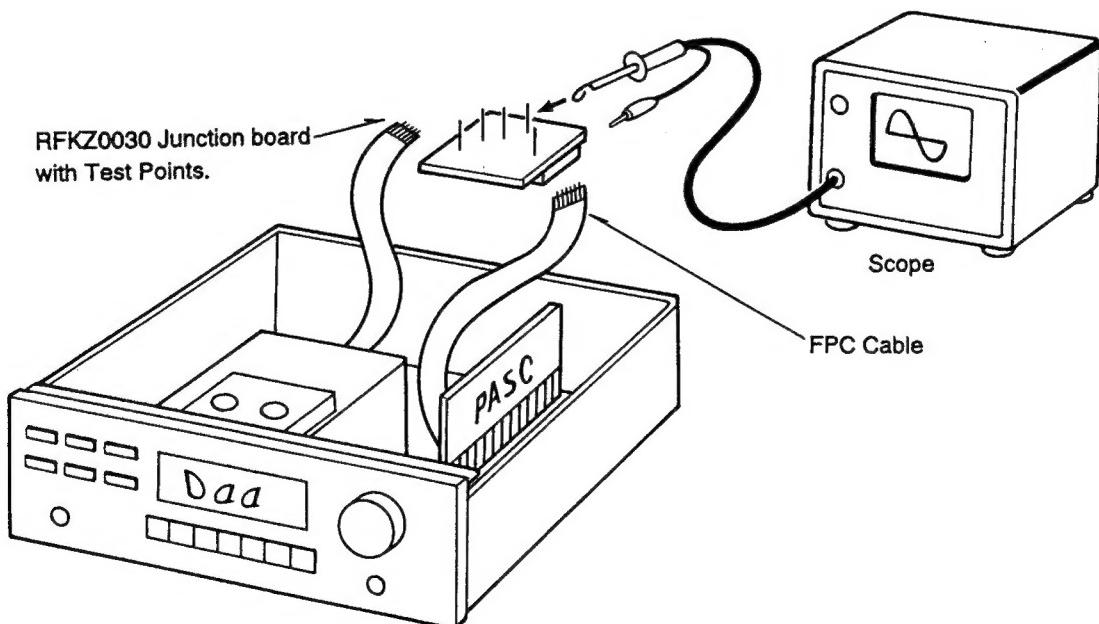
Appearance	Part No.	Description
 (Dec. '92)	DCC-S1	Test Tape
 (Dec. '92)	RFKZ0033	Blank Tape
 (Design should be changed) (Dec. '92)	RFKZ0034	Music Tape (848 981-5)

《Troubleshooting Method》

How to connect the REKZ0030 Junction board and easy to confirm the Record/Playback envelopes.



RFKZ0030 Junction Board



13. TROUBLESHOOTING & QUICK SERVICE INFORMATION

RS-DC10 Trouble Examples

Symptom	Cause	Remedy
1) Tray sometimes opens.	Connector (JW06) inserted incompletely.	Insert it completely.
2) No sound is heard at times.	Same as above.	Same as above.
3) Tape fails to come out.	Connector (JW05)	Insert it again.
4) Unit cannot be turned ON.	Open of diode (D812).	Replace it with a new one.
5) Only DCC the not read.	Shutter OPEN/CLOSE lever return spring slipped off.	Repair it.
6) No headphone output.	Open of RH02	Replace it with a new one.
7) Tray closed opens soon.	Control board out of position.	Correct it.
8) No recording can be made with other manufacturer's optical input. Pioneer CLD303/CLD939 Sony ZS-F1	Pitch shift clock mode of some other appliance's digital output is out of standard.	